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# ROCK PRODUCTS

SEPTEMBER  
1946

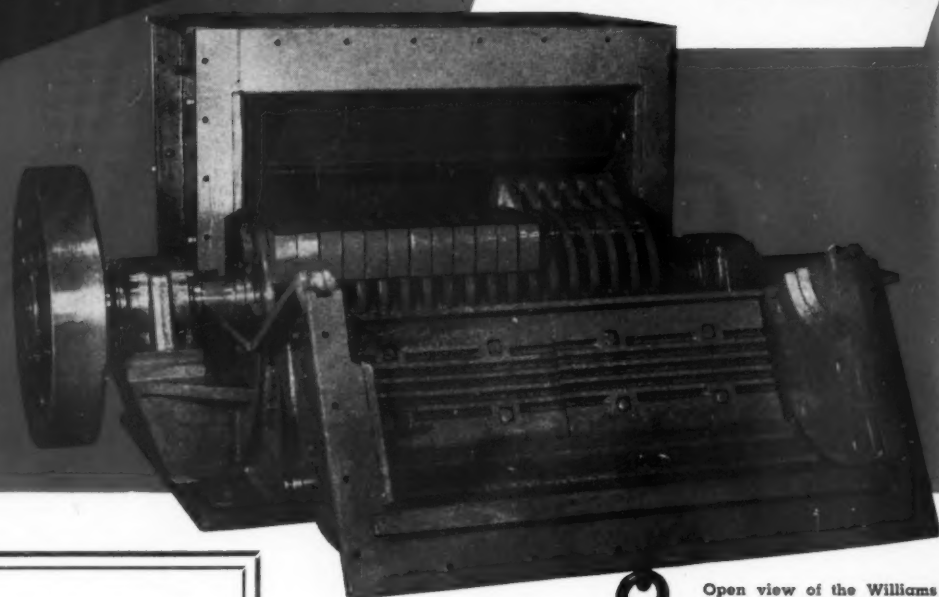
Library of Geology



Dredging Sand on the Missouri River

**DESIGNED  
ESPECIALLY FOR  
AGSTONE**

**WILLIAMS  
"NF" HAMMER  
CRUSHER**



Open view of the Williams "NF" Mill showing heavy duty hammers, grinding plates, side liners and cover liners. Also shows easy accessibility to mill for repairs, etc.

## FEATURES OF THE "N F"

- Adjustable grinding plate.
- Hammers adjustable to overcome wear.
- Larger capacities.
- Lifetime construction.
- 2" top liners, 1" side liners.
- Easy to work on—hinged cover.

The Williams "NF" Hammer Crusher was designed especially for reducing 4" or smaller stone to  $\frac{3}{4}$ ",  $\frac{1}{2}$ " or agricultural limestone. Embodies all the outstanding features Williams has developed in hammer mill design and construction and has proved itself an outstanding performer in the field. The "NF" is built in a large range of sizes with capacities from 9 to 35 tons per hour when making agricultural limestone, affording a size mill for any job. Its principles of operation—a combination crushing and grinding—enables it to make agstone that meets rigid size specifications at a good margin of profit to producers.

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PATENT CRUSHERS GRINDERS SHREDDERS



*A development of*  
**B.F. Goodrich**  
**FIRST IN RUBBER**



Photo courtesy U. S. Bureau of Reclamation

## That's no place for a tool to strangle

### *A typical example of B. F. Goodrich improvement in rubber*

THEY'RE drilling holes for dynamite charges, to blast out rock for a dam. It's no cinch to lug a heavy air hammer up that cliff. Too many times it had to be promptly carried down again—the tool had choked to death.

Oil in the compressor sprayed out into the air hose. Oil destroys rubber. Particles of rubber came loose, flew up into the air hammer, finally choked and ruined it.

B. F. Goodrich engineers who had designed and made hundreds of kinds

of better hose, set out to find the answer to this problem. They worked on a new "recipe" for rubber, and by adding, subtracting, changing proportions, they finally found a rubber that would not only have high resistance to oil, would not flake off to choke tools, and yet had the flexibility needed for air hose.

Hose lined with this new rubber was made and put to work. On jobs where hose had had to be changed in weeks to save tools, this new B. F. Goodrich hose lasted months, even

years. The development was just in time to save money and trouble on big jobs such as Shasta, where 57 miles of BFG hose was used.

Development work like this goes on constantly at B. F. Goodrich to improve every product. That's why you're sure of better values in rubber when you specify B. F. Goodrich to your distributor. *The B. F. Goodrich Company, Industrial Products Division, Akron, Ohio.*

**B.F. Goodrich**  
RUBBER and SYNTHETIC products



# Rock Products

SEPTEMBER, 1946 VOL. 49, NO. 9

THE INDUSTRY'S  
RECOGNIZED AUTHORITY

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Manager

**Nathan C. Rockwood**  
Editorial Consultant

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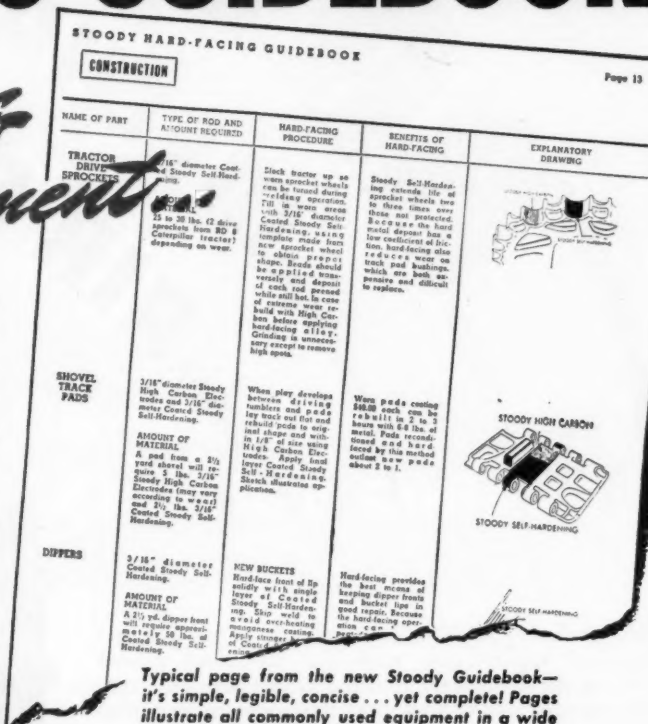
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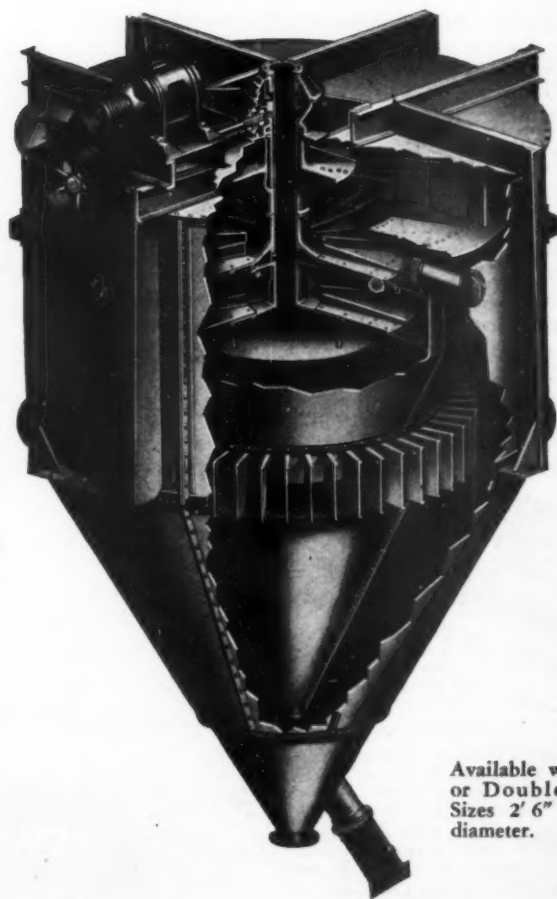
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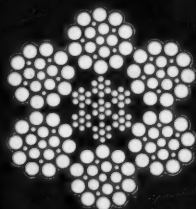
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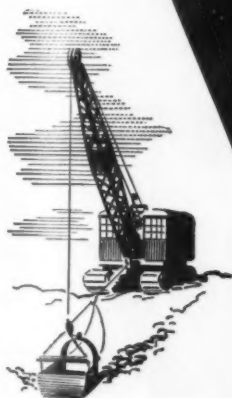


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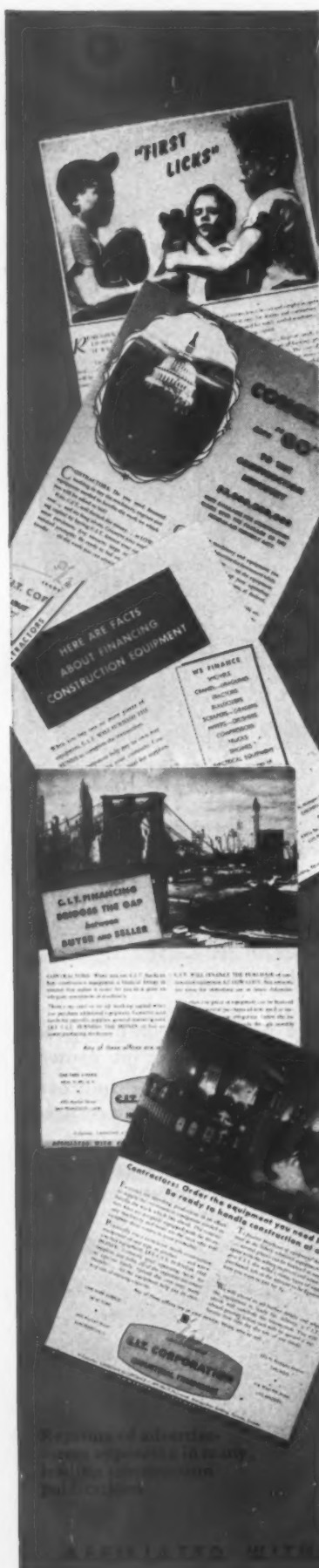
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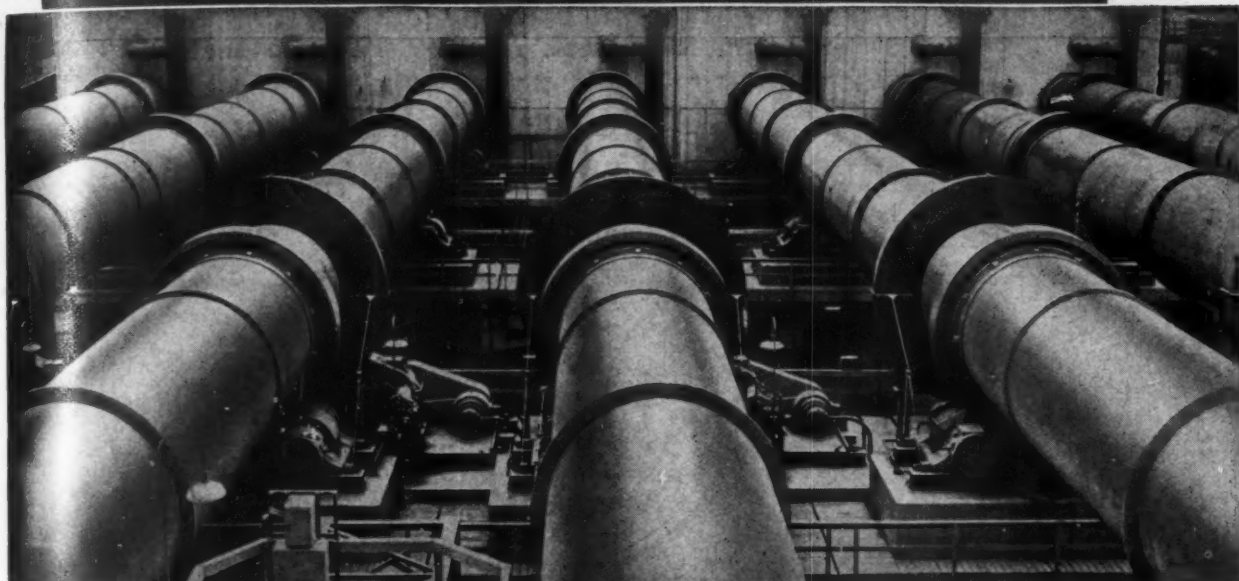
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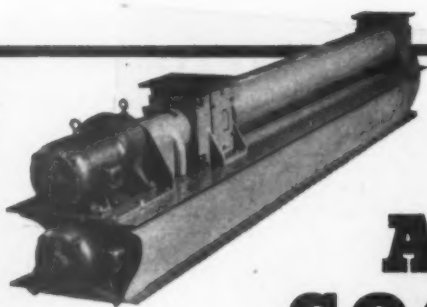
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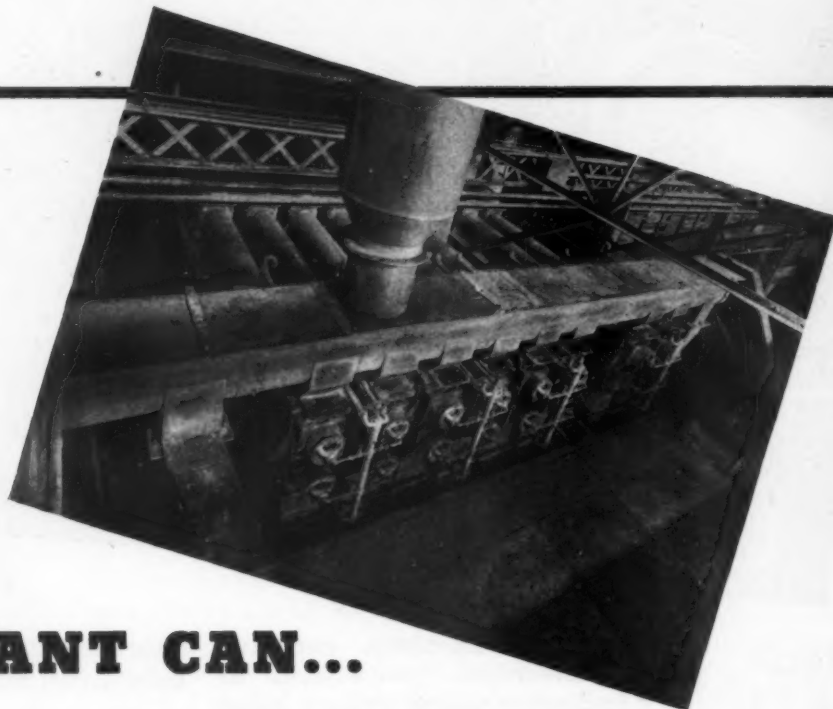
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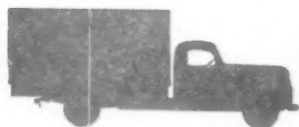
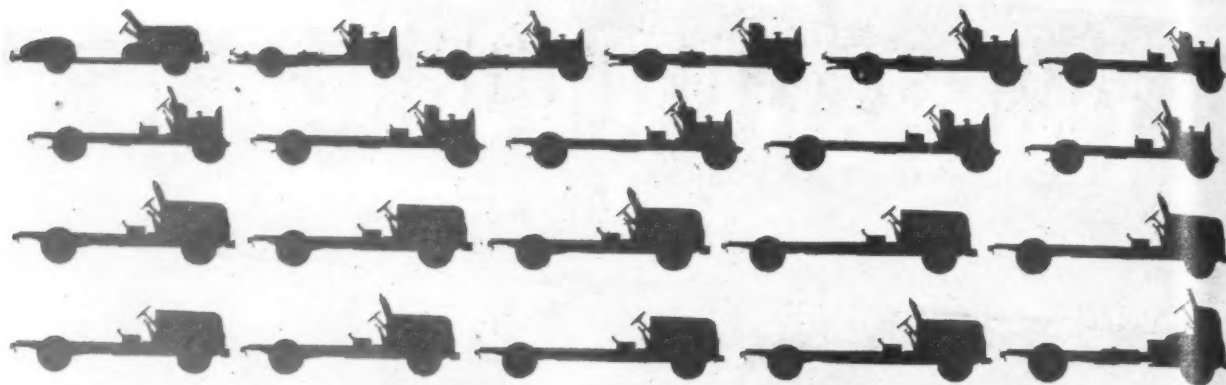
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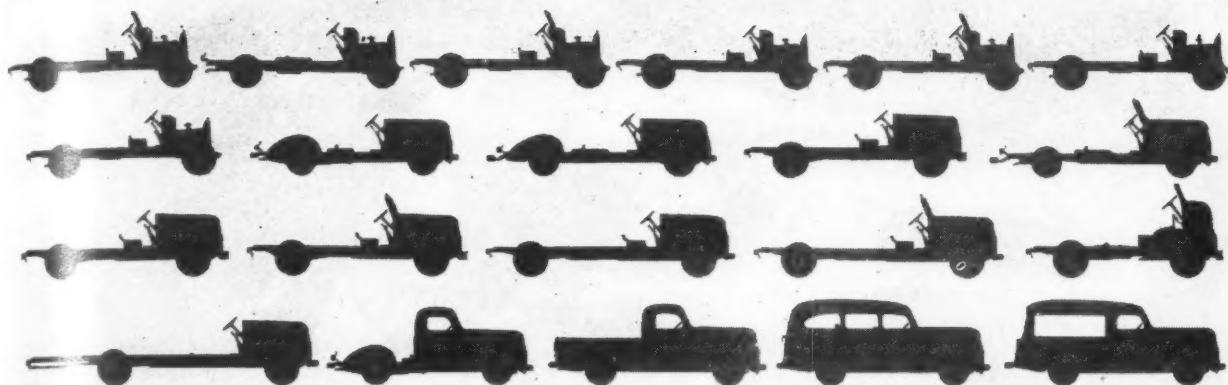
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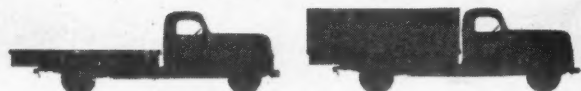
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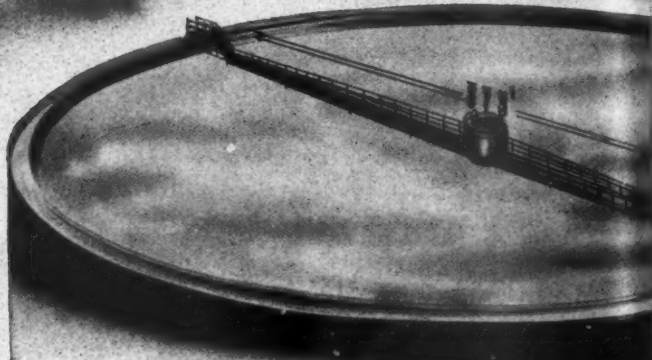
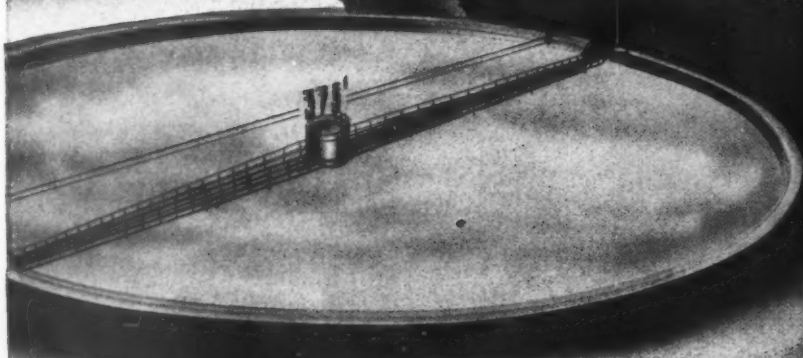
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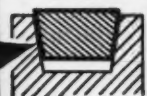


*it's the*  
**SIDEWALL**

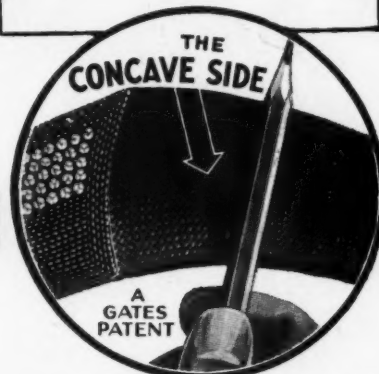
of a V-Belt that  
**Gets All the WEAR -**

*-That's Why the*  
**CONCAVE SIDE**  
*is IMPORTANT!\**

**V-Belt  
In Sheave**



Clearly, it's the sides of a V-Belt that do all the gripping on the pulley and get all the wear against the sheave-groove wall. That's why longer life for the sides means longer life for the belt!



Every man who works around V-Belt driven machines knows from experience that it is nearly always the *sidewall* of a V-Belt that *wears out first*.

There is a perfectly natural reason why the wearing out starts with the sidewall—and here it is—

It is the *sidewall* of a V-Belt that has to *grip* the pulley and drive it. It's the sidewall that *transmits* to the pulley all the power the pulley ever receives. No other part of the belt gets anything like the *actual* wear the sidewall gets. Is it any wonder the sidewall of the *ordinary* V-Belt is the part that wears out first? Clearly, then, prolonging the life of the sidewall is the *one thing needed* to prolong the life of the belt!

The simple diagrams on the right show clearly why the ordinary, *straight-sided* V-Belt gets excessive wear along the *middle* of the *sides*. They show also why the Patented Concave Side *greatly reduces* sidewall wear in Gates Vulco Ropes. That is the simple reason why your Gates Vulco Ropes are giving you so much longer service than any straight sided V-Belts can possibly give.

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**DENVER, U. S. A.**

World's Largest Makers of V-Belts



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469

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Engineering Offices  
and Jobber Stocks

**IN ALL INDUSTRIAL CENTERS** of the U. S. and  
71 Foreign Countries

ROCK PRODUCTS, September, 1946

**\*Even MORE Important NOW**

with Rayon Cord and Other Stronger Tension Members

Now that Gates Specialized Research has resulted in V-Belts having much stronger tension members—tension members of Rayon Cords and Flexible Steel Cables, among others—the sidewall of the belt is often called upon to transmit to the pulley much heavier loads. Naturally, with heavier loading on the sidewall, the life-prolonging Concave Side is more important today than ever before!

Straight Sided  
V-Belt

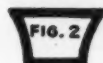


How Straight Sided V-Belt  
Bulges When Bending Around  
Its Pulley



You can actually feel the bulging of a straight-sided V-Belt by holding the sides between your finger and thumb and then bending the belt. Naturally, this bulging produces excessive wear along the middle of the sidewall as indicated by arrows.

Gates V-Belt with  
Patented Concave  
Sidewall

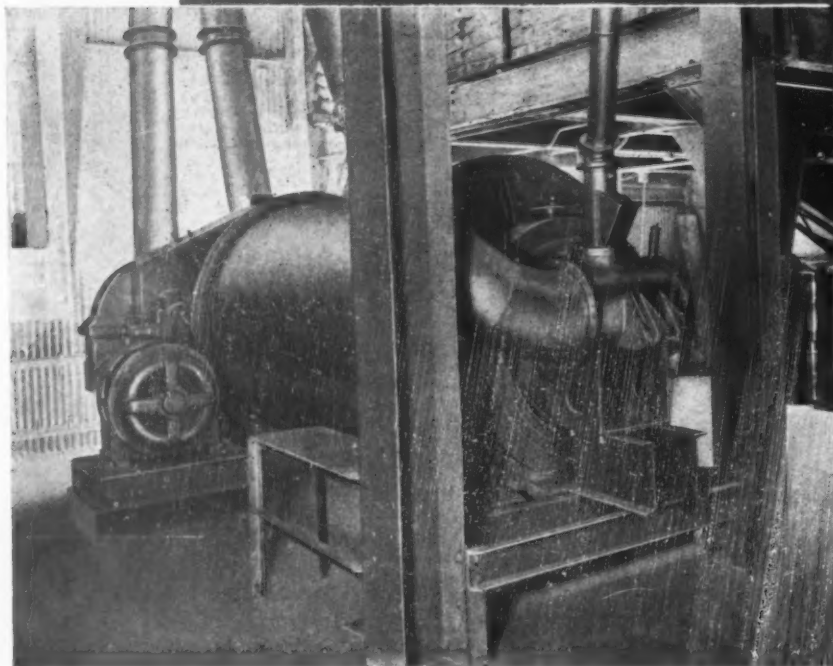


Showing How Concave Side of  
Gates V-Belt Straightens to  
Make Perfect Fit in Sheave  
Groove When Belt Is Bending  
Over Pulley



No Bulging against the sides of the sheave groove means that sidewall wear is evenly distributed over the full width of the sidewall—and that means much longer life for the belt!

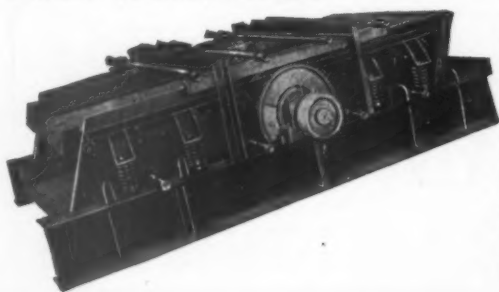
# Machinery for



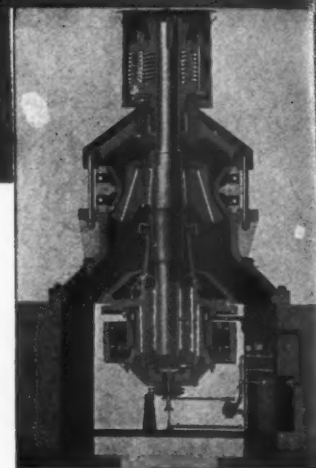
**THIS 5½' x 8' KENNEDY AIR SWEEP TUBE MILL PRODUCES 7 TONS PER HOUR—with a feed of 4x¾ in. limestone and dust**

Use the Kennedy Air Swept Tube Mill to get superfine grinding at bottom costs. The product ground in this tube mill and collected in three cyclones is (1) 5 tons per hr of 80% through 200 mesh, (2) 1 ton per hr of 92% through 200 mesh, and (3) 400 lbs per hr of 99.8% through 325 mesh. Simple adjustment permits a desired variation from this combination of fine mesh sizes. The mill is driven through the remarkable Kennedy Integral Gear Drive for Tube Mills. This enables the motor to be direct-connected to the high speed shaft. The gears cannot be misaligned or set wrong. Power required to drive the mill is thus greatly reduced.

**KENNEDY VIBRATING SCREENS . . .**



give positive action on the screen cloth without transmitting vibration to supporting members. They are made in a wide variety of sizes with single or double decks and to meet any screening requirements. The type of vibration used permits lower speeds for large pieces and higher speeds for small pieces. Material is continually turned over when passing along the screen surfaces. In this way, exceptionally high efficiency is obtained at all times.



**KENNEDY BALL BEARING GEARLESS CRUSHER . . .**

With a Synchronous Motor built in its pulley, this machine shows 80% saving in the cost of maintenance and a saving of 50% in power over geared crushers. It has produced 156 tons per hour when set to 7/16" between the head and concaves at the bottom. The motor runs on ball bearings and is continuously lubricated by a force feed lubrication system. The motor is built especially for this crusher.

**Burn The Smaller Sizes Too**

**Kennedy Vertical Continuous Discharge Kiln**

By calcining stone ranging ¾" to 1¾", this kiln utilizes what would ordinarily be waste for the old type vertical kiln. Fuel is thermostatically controlled, making the kiln practically automatic. It discharges continuously, eliminating over-burned or underburned lime. If your lime market is too small to warrant a Preheater and Rotary Kiln installation you can produce a better grade of lime five to ten tons daily with the Kennedy Vertical Continuous Discharge Kiln. It has a lower power requirement, high thermal efficiency, and produces a quality product.

## KENNEDY-VAN SAUN MFG. & ENG. CORPORATION

# AGRICULTURAL LIMESTONE and LIME MANUFACTURE...

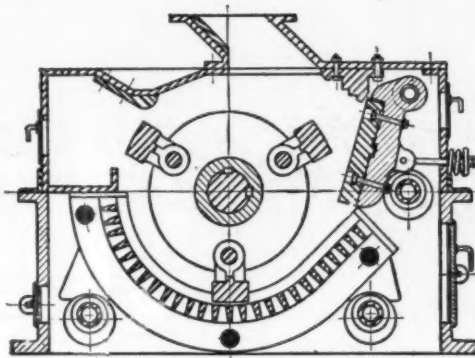
Kennedy Machinery can put your plant up among the leaders. It has been developed by more than 50 years in designing, manufacturing, and installing practically every type of machinery used in Rock Products plants. How the Kennedy line provides the latest in scientific lime and agricultural limestone production is shown in the Kennedy advancements described here. With Kennedy machinery you can have greatest confidence that your plant will maintain its high initial efficiency for years to come.

# KVS

Machinery and equipment for the complete lime or agricultural limestone plant incorporates the most efficient principles applied to each type of machine plus exclusive Kennedy refinements.

## The Best Hammermill Features

are built into Kennedy Roll Hammer Crushers. The Type "E" machine which is diagrammed at the right is equipped with from three to eight hammers, depending on the material to be pulverized. This machine is easy to adjust while in operation, by cam arrangements. The weight of the hammers depends largely upon the diameter of the machine and the material handled. Shafts are carried in ball bearings. Type "E" pulverizes from 75 to 500 tons per hour depending upon the size machine.



## THE LATEST IN SCIENTIFIC LIME PRODUCTION - KENNEDY STONE PREHEATER - ROTARY KILN DEHEATER AND SOAKING PIT

**20% Increase in Capacity—40% Savings in Fuel**

It is now possible to combine the superior product of a rotary kiln with the operating economy of a vertical kiln with the Kennedy Stone Preheater and Deheater. By partial calcining the material this system reduces kiln wear and kiln lengths. It recovers and utilizes pit gases, and has proved so efficient in actual operation that 40% fuel savings and increased output exceeding 20% have been obtained.

Short kilns employing the Kennedy method also acquire an internal glaze which lessens the wear on kiln liners, lowers the power requirements, and reduces formation of kiln rings. Overburned and underburned lime is practically eliminated. Coal feed and lime calcination are switchboard controlled.

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COOLERS  
DRYERS  
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HAMMERMILLS  
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*Write Today*

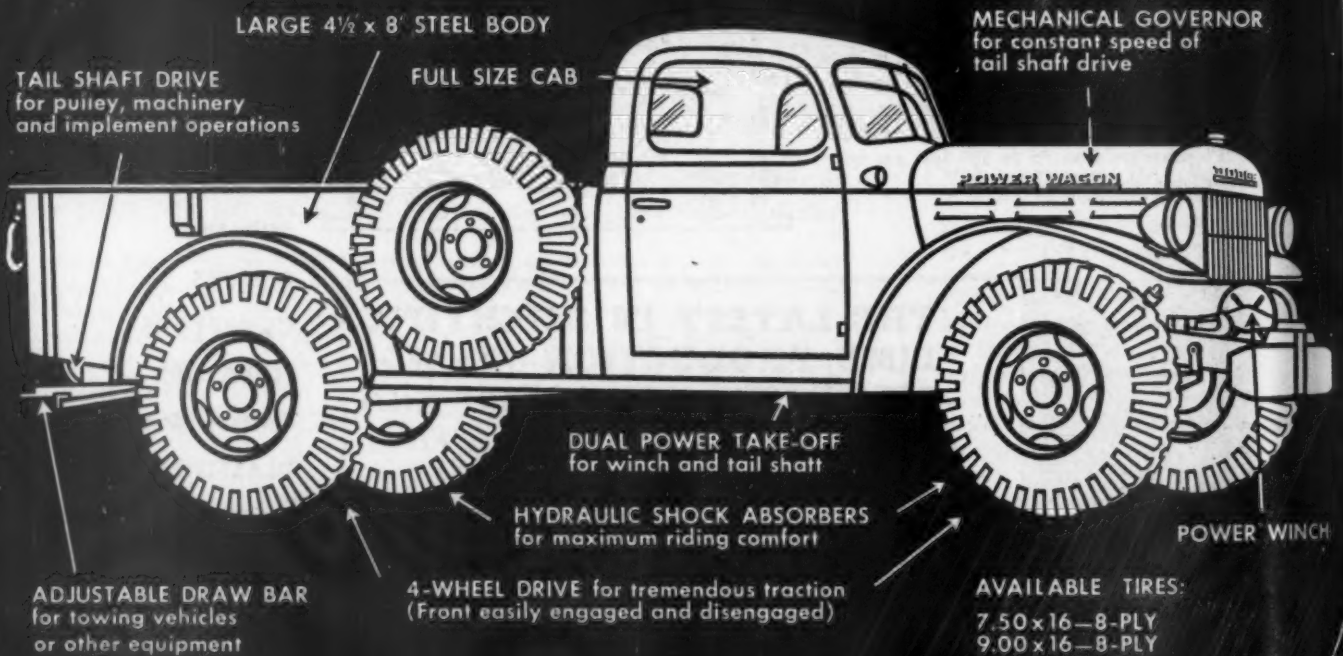
for our catalog and description on these and other types of KENNEDY machinery.

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# DODGE ANNOUNCES THE

# POWER WAGON



Carries welding equipment, shot drills and other machinery on oil fields.

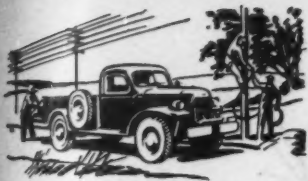


Its powerful winch elevates heavy materials in logging and other industries.

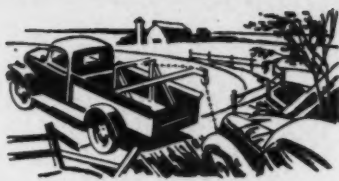


Quarries, mines and gravel pits find plenty of uses for its power and traction.

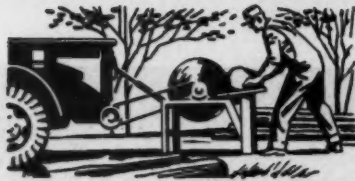
ONLY DODGE BUILDS "Job-Rated" TRUCKS!



Public utilities call it the most versatile vehicle in their fleets.



Its power and traction make it the ideal "wrecker's" car.



Its portable power plant (pulley or shaft drive) is always available.

# POWER WAGON

It's a "FULL SIZE" truck for jobs no other truck can do!

Here's the truck that needs no roads . . . the new and remarkable Dodge Power-Wagon. It's the kind of truck you've hoped someone would build some day.

It's a *full size* truck! It has a full size *body* for your loads. It has a full size *cab* for your comfort. It has full size *power* to go places and do things other trucks can't do.

With four-wheel drive, you can cross fields, plow through deep sand or mud, cross streams and climb tough, rugged hills.

With dual power take-off, it's a "power-house" on wheels. Heavy loads can be hoisted or

pulled with a front-mounted power winch. From pulley-drive and tail shaft you can saw wood, grind grain, and operate a wide variety of machinery and equipment.

Like all Dodge trucks, the Power-Wagon is *Job-Rated* . . . engineered and precision-built to fit the job . . . to save money on the job . . . and to last longer.

Chances are that *you* have a job that the Power-Wagon can do *better* than any other vehicle. See your Dodge dealer now. See the Power-Wagon. See what it can do for you on your job.

DODGE DIVISION OF CHRYSLER CORPORATION

## POWER-WAGON FEATURES

Six-cylinder, 94-H.P.  
Job-Rated Engine.  
Four-wheel Drive (Disengagement for rear wheel drive).  
Full Floating Front and Rear Axles.

Heavy-duty, double-acting Shock Absorbers.  
4-speed Transmission—2-speed Transfer Case (8 Forward Speeds—2 Reverse Speeds).  
High Traction Tread Tires.

### AUXILIARY EQUIPMENT

{ Power Take-off • Power Winch • Pulley-Drive • Tail Shaft • Draw Bar, Front Tow Hooks, and Pintle Hook

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available literature  
illustrating and  
describing The  
POWER-WAGON.

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CITY AND STATE.....

# Introducing the

## ST. REGIS FIELD ENGINEERING ORGANIZATION

H. S. Hangen,  
Director

### Lehigh Valley Area

G. W. Leopold, Manager  
F. T. Honeyman  
W. W. Thomas  
C. H. Rodgers  
J. H. Divaly  
Eugene Moore

### Southern States Area

H. S. Rhodes, Manager  
G. E. Huot  
B. L. Willis  
P. L. Taylor  
C. A. Williams

### Ohio-Western Pennsylvania Area

V. L. Plush, Manager  
J. H. Deacon  
F. H. Loughran  
R. H. Gwinn

### Midwestern Area

E. E. Arnold, Manager  
H. E. Duggan  
C. F. Haysen  
H. J. Zenke  
John Stohr  
G. W. Fenwell  
W. O. Brodine

### New York-New England Area

Elmer Wilke, Manager  
D. A. Bromal  
H. J. Isella  
John Gans

### West Coast Area

D. A. Flischman, Manager  
R. S. Brown  
B. M. Crosby  
A. S. Wood  
R. G. Beasley  
H. N. Rollard

These pages are dedicated to the director and the six divisional managers of the St. Regis Field Engineering organization.

To the veterans of the cement industry these men need no introduction. They and their staffs have been servicing over 2,000 St. Regis packers in rock products plants throughout America for a long, long time.

With confidence that the cement industry joins with St. Regis management in recognition of the value of these "packer doctors", we propose in this and subsequent issues to introduce each of the 33 members of this national organization.

They are "on call" day or night for the cement mills of America.



H. S. ("Stan") Hangen . . . director of the Field Engineering Division since 1929. Stan joined St. Regis in 1918 after a period as a machine shop foreman and affiliation with several cement companies. He supervised packer installations for St. Regis in the Nazareth, Pa., area until 1929 when he took over his present position. Now, with headquarters in New York City, he supervises the installation of St. Regis Packaging Systems and the servicing of nearly 3,000 packers in American industries.





Elmer Wilke . . . Elmer started as a draftsman in the engineering department of St. Regis in 1922, where he prepared layouts for installations. A desire to see some of these brain children in actual operation prompted Elmer to switch to the field engineering division a few years later. At one time he supervised installation of packers in Canada, but now, in addition to being assistant director of field engineering, he covers upper New York State and the New England area.



D. A. ("Dave") Fleischman . . . before coming to St. Regis in 1913 Dave had been affiliated with two cement companies and his knowledge of that industry proved invaluable when the valve bag filling machine was first introduced. During World War II Dave devoted his time to the production of war material at the Oswego Machine Shop. Now he's back supervising all field engineering work on the West Coast.



E. E. ("Eddie") Arnold . . . twenty-four years ago Eddie joined St. Regis and since then has become as permanent a fixture as the famous Loop in Chicago. Using that city as a base of operations, Eddie has supervised the installation of St. Regis valve bag filling machines throughout his big midwestern territory. Eddie's hobby while on business trips is a friendly game of pinochle . . . and it is estimated by some of his victims that he doubles his income every time he goes on the road from Chicago.



H. S. ("Herm") Rhodes . . . it was in 1930 that we got Herm and his uncanny ability to keep things running. He is one of Frank Plush's boys, and it is rumored that Herm took one look at Frank's size and swore that if eating would do it he was going to be even bigger. It's a close race. From Birmingham he now covers most of the growing Southern industrial area.



F. L. ("Frank") Plush . . . Frank joined us in 1917. His experience as a millwright stood him in good stead when the Bates Packer was being introduced to industry. Frank's hobby is golf, which he shoots in the low 80's, but these days he is pretty busy putting in full time on the road and at his desk in Toledo.



G. W. ("George") Leopold . . . George joined us in 1927 when he became convinced that he should get out of the foundry and machine business and into the bag and packaging field. Since 1930 he has been in charge of St. Regis Packer installations in the Lehigh Valley area, the largest cement producing section in the world.



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**ST. REGIS SALES CORPORATION**  
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*why* LEADING OPERATORS

*specify* **Thor**

**ROCK DRILLS**



*The Engineer knows this sturdy chuck is easily replaceable . . . less expensive*

THE CHUCK of a rock drill holds the drill steel in alignment. Located at the "business end" of the drill, it is most vulnerable to wear since it must take the punishment of steady rotation plus constant pounding against the collar of the steel.

To maintain efficiency and protect against excessive steel breakage or damage to the piston hammer, the chuck, while extremely rugged, still must be replaced regularly.

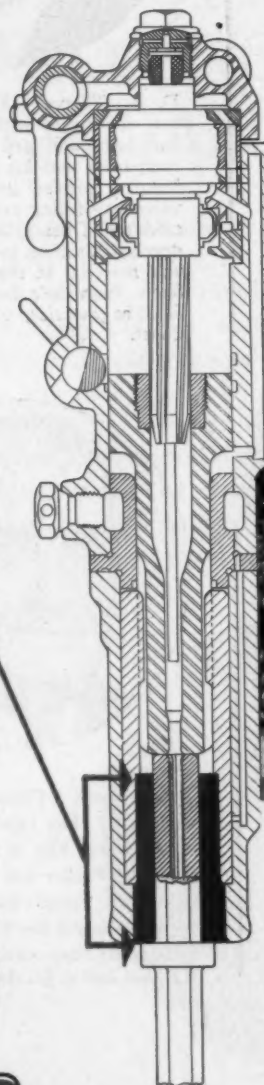
In THOR Rock Drills, the chuck assembly is designed so that this replacement is quick and easy . . . and twice as economical because THOR Chucks *cost less to replace!*

Ask your engineer to check this and other THOR advantages—He'll agree—your nearby THOR Distributor stocks the tools that will give you more work . . . *at lowest cost!*

**INDEPENDENT PNEUMATIC TOOL COMPANY**

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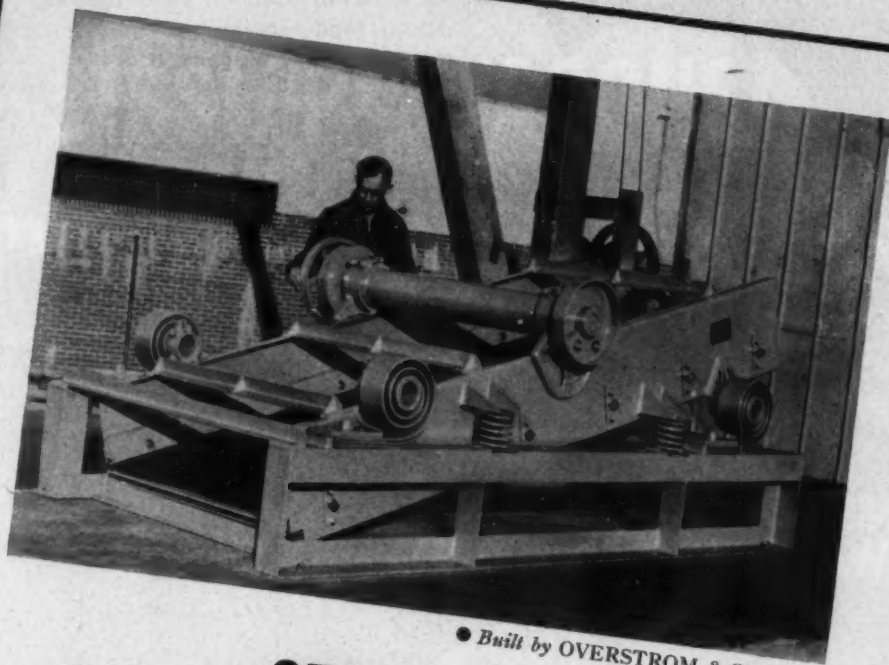


**Thor**

**PORTABLE POWER**

**TOOLS**

PNEUMATIC TOOLS • UNIVERSAL AND HIGH FREQUENCY ELECTRIC TOOLS • MINING AND CONTRACTORS TOOLS



• Built by OVERSTROM & SONS

## screening 250 TPH on **SKF** Spherical Roller Bearings

It's a tough job . . . screening crushed limestone 8" and under at the rate of 250 tons per hour—sometimes through a 4" square clear opening and then again through a 2" square opening. Yet this 4' x 10' single deck Overstrom Heavy Duty Vibrating Screen does it easily on **SKF** Spherical Roller Bearings. In spite of heavy, gyrating loads, these bearings perform smoothly and steadily for years.

For they have rolling alignment, high capacity, equalized load distribution, low maintenance requirements and all the other advantages that bearings should have to work on screens that work on tough jobs. Another example of what **SKF**'s pioneering the spherical roller bearing has meant to Industry.

**SKF** INDUSTRIES, INC.  
Front St. & Erie Ave., Phila. 34, Pa.

6119



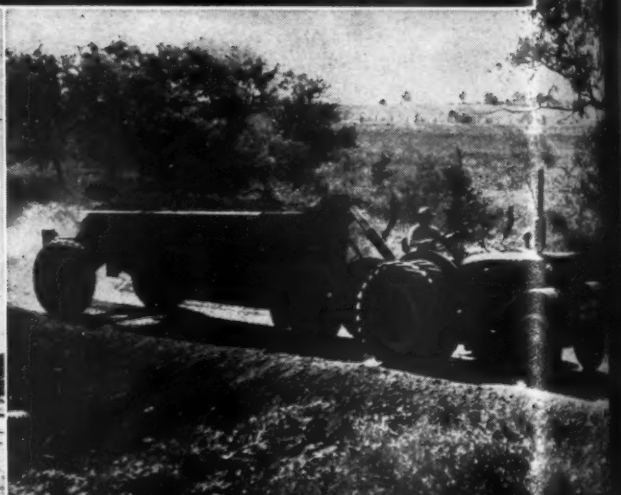


Pit material used for roadbed treatment and detour road topping was quickly dumped by the Mississippi Wagons in accurate windrows.



↓ A Mississippi Wagon takes on its 10-yard load at the gravel pit, six miles off the highway.

↓ Rolling fast over the long lead-in road, the Wagons averaged better than 20 m. p. h. for each round trip.



MISSISSIPPI WAGON



# MISSISSIPPI WAGONS

## Cut Time and Cost of Hauling on Texas Highway Job

**T**HE H. E. WILLIAMS COMPANY, of Waco, Texas, used a fleet of ten Mississippi Wagons for the long-distance hauling of 78,000 yards of pit gravel, in the reconstruction of six miles of Texas Highway No. 6, south of Waco.

Needed for both roadbed treatment and detour road topping, the gravel had to be moved from a pit six miles off the highway, over a haul route averaging 9.5 miles to the dump and 10.5 miles return.

Carrying 10-yard payloads, the ten Mississippi Wagons moved an average of 1,000 yards a day over the rough, rolling haul road. Each Wagon averaged ten 20-mile round trips per 10-hour day, covering each round trip at an average of over 20 m. p. h.

Records of the H. E. Williams Company on this job show a total cost for hauling with Mississippi Wagons of 34.3¢ per yard, or 3.6¢ per yard-mile, including reserves for depreciation, parts and tires.

"This figure," says Mr. Williams, "is very pleasing to us, as it is considerably lower than the best records of hauling equipment previously used by us on similar work. We are also well satisfied with the general performance of our Wagons—their ease of handling, superior flotation on soft ground, and efficient operation both on and off the highway."

The ability of Mississippi Wagons to move yardage fast and cheaply is being demonstrated every day on jobs all over the country. Ask any owner what he thinks of Mississippi Wagons—then ask your nearby distributor for facts and figures on what Mississippi Wagons can do for YOU.

**M-R-S MANUFACTURING COMPANY**  
Jackson, Mississippi, U. S. A.

When profits depend on low-cost hauling... You can depend on **MISSISSIPPI WAGONS!**

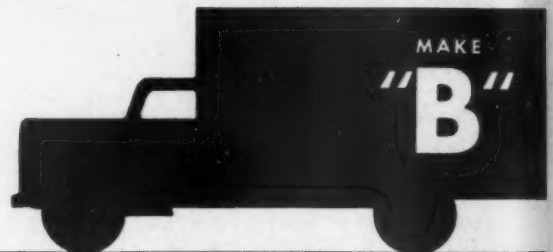
★ *The World's Most Modern Hauling Unit*

# HERE'S IMPARTIAL PROOF MACKS LAST LONGEST!

**1. FACT:** 14% of all Mack Trucks on the road today were built before 1929...every seventh Mack is over 16 years old.



**2. FACT:** Closest runner-up, make "B" has only 10.3% trucks on the road with 16 years service to their credit.



**3. FACT:** Make "C" has only 7.8% trucks now in use 16 years:



**4. FACT:** Make "D" has only 6.6% of their trucks still operating after 16 years.



(The basic figures are from the latest authoritative national survey of truck registrations, by R. L. Polk & Co.)

**MORE** Mack Trucks are still rolling profitably for owners—years after they've paid for themselves in dependable service—than any other make.

**Mack**  
TRUCKS  
FOR EVERY PURPOSE

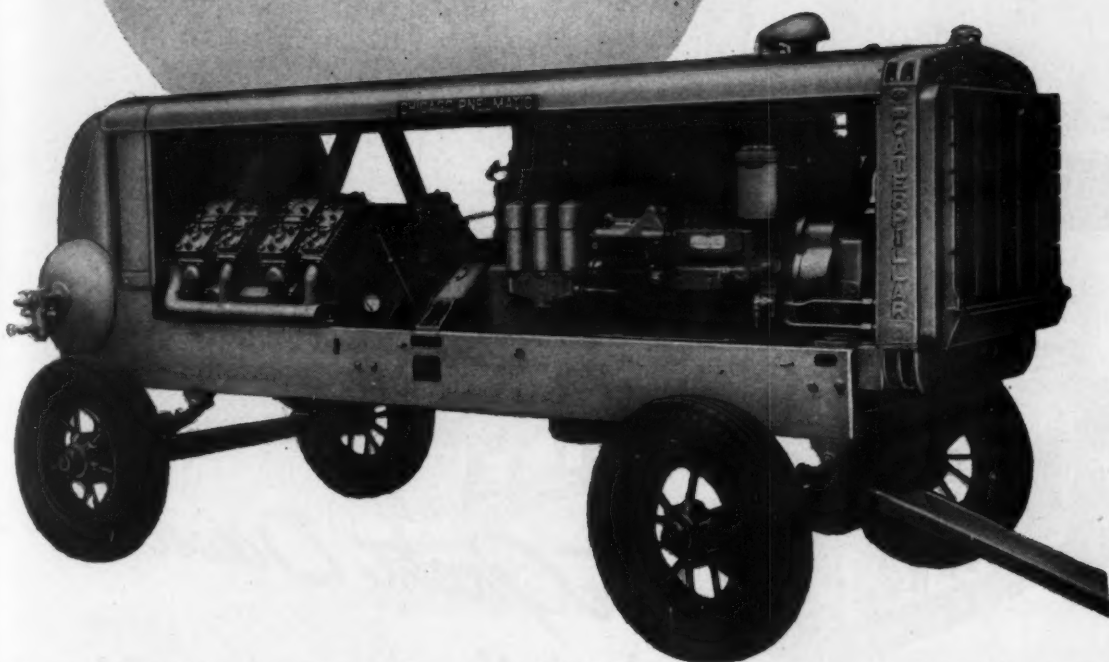


**Performance  
Counts!**

Mack Trucks, Inc., Empire State Bldg., New York, N. Y. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J.; Long Island City, N. Y. Factory branches and dealers in all principal cities including Toronto and Montreal, Canada.



# FUEL-THRIFTY COMPRESSOR



## meets air demands exactly

This CP-500 Diesel-driven portable air compressor delivers 500 cubic feet of air a minute when it is needed. But whenever the air demand slackens, the engine speed does likewise.

This is because the CP Gradual Speed Regulator automatically synchronizes the engine speed to variations in air demand. The engine never runs at any speed higher than required,

avoiding fuel wastage and minimizing maintenance.

CP-500 is one of a line of CP Portable Compressors, available in gasoline powered models of 60, 105, 160, 210 and 315 C.F.M. and in Diesel-powered models of 105, 160, 210, 315 and 500 C.F.M.

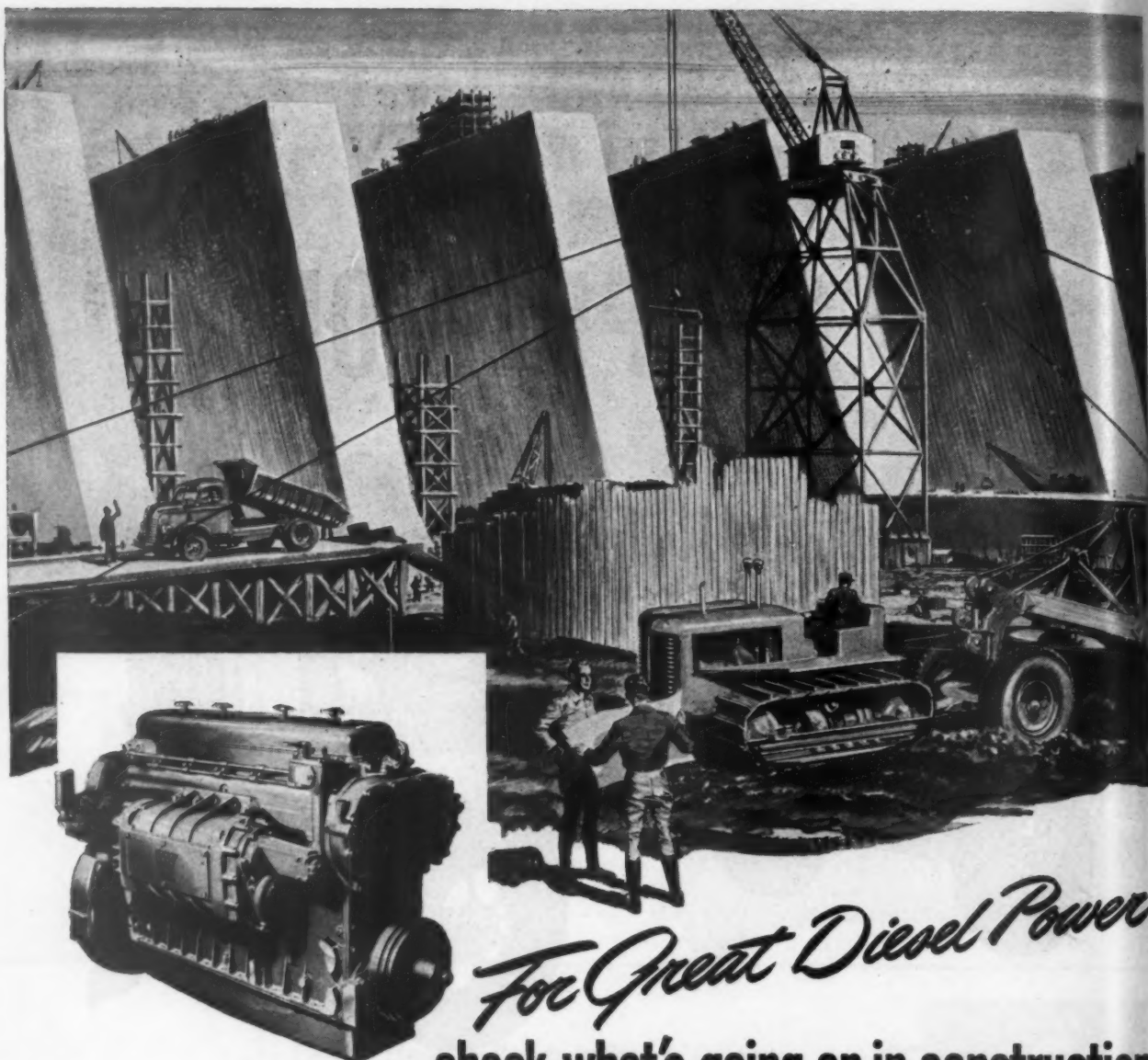
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ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES



## For Great Diesel Power —check what's going on in construction

**M**ODERN construction projects grow on volumes of power. It has to be dependable, hard-hitting, low-cost power.

And what do you find providing that kind of power throughout the industry? General Motors series 71 Diesel engines. You find them in trucks and tractors, in welders and trenchers, in earth movers, graders, compressors, pumps and what-not.

Because these Diesels are compact as well as powerful. They're lower in weight

as well as husky. They're easy to start and they stay on the job.

These are qualities that bring Diesel power advantages to operators who couldn't consider it before.

*So whatever needs for power you may have in road-making machinery, crushers, shovels or any other construction equipment—look to GM Diesels.*

### DETROIT DIESEL ENGINE DIVISION

DETROIT 33, MICH. • SINGLE ENGINES . . . Up to 200 H.P.  
MULTIPLE UNITS . . . Up to 800 H.P.  
GENERAL MOTORS



### Features of GM Diesels Important to Every User of Power

**QUICK TO START**—on their own fuel

**LOW COST**—run on common fuel oil

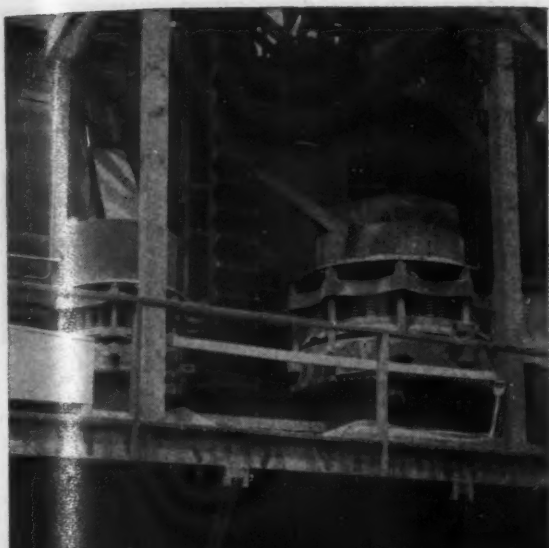
**EASY TO MAINTAIN**—clean design plus accessibility

**LESS FIRE HAZARD**—no volatile explosive fuel

**COMPACT**—readily adaptable to any installation

**SMOOTH OPERATION**—rotating and reciprocating forces completely balanced

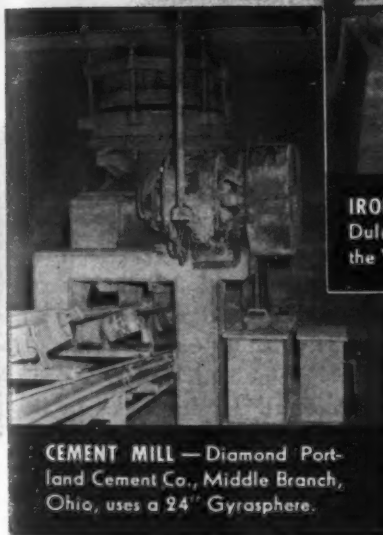
**QUICK ACCELERATION**—2-cycle principle produces power with every downward piston stroke



**QUARRY PLANT**—Arundel Corp., Baltimore, Md., operates six Gyrasphere Crushers of all sizes.



**GRAVEL PLANT**—Boston Sand & Gravel Co., Cambridge, Mass., operates this 48" Gyrasphere.



**CEMENT MILL**—Diamond Portland Cement Co., Middle Branch, Ohio, uses a 24" Gyrasphere.



**IRON MINE**—Snyder Mining Co., Duluth, uses 48" Gyrasphere in the Virginia Mine, Eveleth, Minn.

**FINER CRUSHING**

**ENORMOUS TONNAGE**

**WIDER RANGE OF SIZES**

**IMPROVED PRODUCT**

**CONTINUOUS OPERATION**

**LOWER UPKEEP**

# TELSMITH

## Gyrasphere SECONDARY CRUSHER

Send for descriptive Bulletin Y-11.

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San Francisco 4—Los Angeles 14  
Wilson-Weener-Wilkinson Co.  
Knoxville 8, & Nashville 6, Tenn.



# for a Carrimor\*



## COMPARE THE RESULTS OF THIS TYPICAL TEST BY AN UNBIASED ORGANIZATION\*

Test Data	LPC Carrimor	Scraper "A"	Scraper "B"
Struck Capacity	8.4 yds.	8.2 yds.	9.25 yds.
Loading Time	1.0 Min.	1.0 Min.	1.0 Min.
Spreading Time	.157 Min.	.172 Min.	.366 Min.
Turning & Travelling time considered as constant for purposes of computation	3.22 Min.	3.22 Min.	3.22 Min.
Total Trip Time	4.38 Min.	4.39 Min.	4.58 Min.
Weighted yds. per trip	7.3	6.1	6.0
Trips per 54 Minute Hr.	12.32	12.30	11.7
Total Yds. per Hr.	89.9	75.0	70.2
Total Yds. per 8-hr. Day	719	600	562

\*Name on request

Claims are easy and talk is cheap but if you want the real facts on which scraper will put the most money in your pocket, we suggest a competitive test with the new 8 yard LaPlant-Choate Carrimor.\*

For example, here are the results of a typical test, conducted by an unbiased organization with no connection with any scraper manufacturer. Every condition was carefully controlled to get as nearly a perfect comparison as possible—same operator, same material, same tractor, same haul and even the same loading time. But look at the difference in scraper production, based on actual weighed loads at the fill! At 25 cents per yard, the LPC Carrimor\* would earn \$29.00 per day more than scraper "A" and \$39.00 per day more than scraper "B".

With an opportunity for extra profits like these, isn't it worth waiting a little longer to be sure of a Carrimor\*—the scraper that's "best by competitive test." LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa; 1022 77th Ave., Oakland, Calif.

\*Reg. U.S. Pat. Off.

# LaPLANT - CHOATE

## Job-Proved Equipment...

for Lowest Possible Cost in Moving Earth

**"100 TONS PER HOUR"**  
**IN LESS THAN 10 MINUTES**  
**—CRUSHING TO 3/4" WITH 75% OVERHEAD**

*From a report of an actual test run of a Cedarapids Junior Tandem made on the job by a well-known contractor. (Name on request.)*



This may not be a record, but it's still darn good production with plenty of profit for the contractor. On some jobs, the Cedarapids Junior Tandem will turn out more tonnage and on others not as much because there are so many outside factors that affect production. However, on job after job, you can count on the Junior Tandem for higher capacity, easier operation, minimum maintenance and low cost.

Here are just a few of the reasons why: Horizontal vibrating screen assures greater capacity, closer grading and higher efficiency. 10" x 24" or 10" x 36" roller bearing jaw crusher and 24" x 16" roller bearing roll crusher provide plenty of crushing capacity for the toughest jobs. V-belts and universal drives eliminate troublesome chains and sprockets. Fast, easy set-up and take-down minimize lost time between jobs. Chip screen and sand eliminator can be used as desired. Choice of feeding methods to fit different loading conditions.

When buying a crushing plant—buy the best—buy Cedarapids. Get the details about the Junior Tandem from your nearest Cedarapids distributor. They're experts in solving aggregate producing and asphalt mixing problems.

**IOWA MANUFACTURING COMPANY**  
 CEDAR RAPIDS, IOWA, U. S. A.

**Cedarapids**

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**IOWA**

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*of Material Handling Equipment Includes*  
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combined to give you  
better service

### WISSCO

In 1857 employees at the Clinton Plant invented the first power loom for the weaving of wire cloth. Today Wickwire Spencer is still a leader in the production of woven wire products.

### CALWICO

The California Wire Cloth Corporation traces its beginning to 1859. Since then it has become the largest producer of high quality woven wire products on the Pacific Coast.

By the merging of the Wickwire Spencer Steel and the California Wire Cloth Corporation (as divisions of the Colorado Fuel and Iron Corporation) the facilities and experience of two great woven wire producers are combined for nationwide service.

Wickwire Spencer Steel Division is ideally equipped to handle volume production of wire cloth used by manufacturers of original equipment—most of whom are located East of the Rockies. The California Wire Cloth Corporation has developed industrial screens for nearly every industry in the Western States—many of them peculiar to that region.

Common to both companies is the precision fabrication of wire cloth in a dozen different weaves—for screening, filtering, separating, grinding, cleaning and procession. All commonly used metals are made into types of wire cloth to give long service under chemical action, corrosion, abrasion, moisture or high temperature.

Our engineers are available to help solve your wire cloth problems. Just write to the nearest office.



#### FREE BOOK ON WIRE CLOTH

These profusely illustrated catalogs are filled with valuable technical information regarding proper selection and usage of wire cloth. Write to nearest headquarters for your copy.

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East of the Rockies it's **WISSCO**  
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On the Pacific Coast it's **CALWICO**  
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MANUFACTURING CO.**

GENERAL OFFICES: HENRY W. OLIVER BUILDING PITTSBURGH, PA.

W&D R536



# Generally Speaking

September 1, 1946

Dear Reader:

Part-time supervisory employees, according to a N.L.R.B. ruling, probably can be excluded from voting in a bargaining election if such employees spend more time as supervisors and the balance as maintenance employees.

\* \* \* \* \*

We hear from California that the business of making adobe bricks is booming due to the scarcity of lumber and concrete block. Farmers are said to be making them in a big way—the only production requirements being a supply of adobe clay, wood forms and a water-resistant chemical.

\* \* \* \* \*

Approval of the Treasury Department is no longer needed for salary increases in the \$5000-and up per year brackets, and a new ruling (T.D. 5506) also makes approval unnecessary in the case of salaries under \$5000 when they are paid to executive, professional and administrative employees not represented by a labor organization. However, in the case of new plants or departments, prior approval of such increases may still be necessary.

\* \* \* \* \*

A new fused phosphate fertilizer has been developed in the west to fit the particular needs of western soils for magnesium and phosphorus. The product is the result of fusing phosphate rock and olivine in electric furnaces by Manganese Products, Inc., in Seattle, Wash.

\* \* \* \* \*

As soon as materials for the purpose are available, a tremendous pent-up demand for post-war home repair and improvement work will open up, according to Arthur J. Frentz, assistant commissioner of the FHA. There are nearly 40,000,000 dwelling structures in this country on which very little improving or modernizing work has been done during the past five years.

\* \* \* \* \*

Another new use for rock has been found. Gabriel Associates has developed a process of converting volcanic rock into a plastic-like material that, either in the raw state or through further processing, may have application for building block, insulation and in items customarily made of porcelain, china clay, plaster, etc. The raw material is exploded in autoclaves and is a very light substance that floats.

\* \* \* \* \*

Small businessmen are getting the break from the War Assets Administration in the procurement of production materials and equipment. A new regulation governing these types of supplies, and giving this precedence, has been issued by W.A.A.

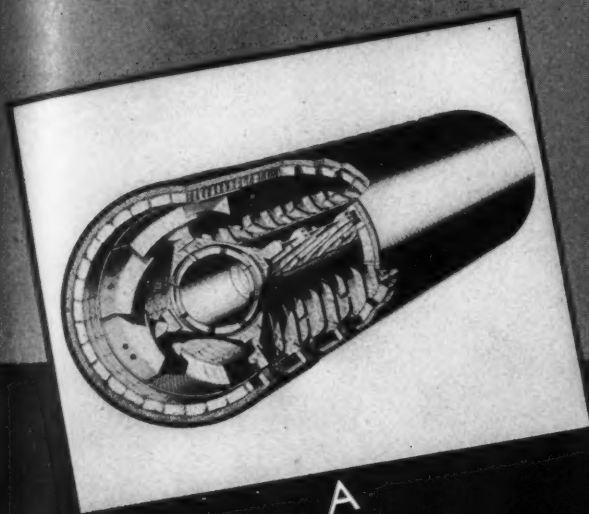
(Continued on page 35)



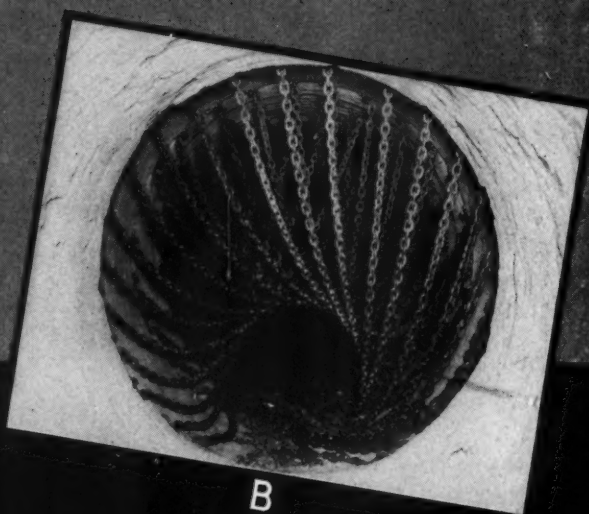




# 3 WAYS TO SAVE FUEL

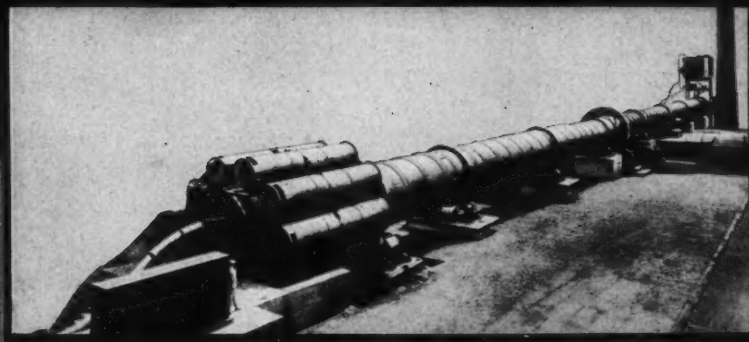


A



B

C



A  
Heat  
Exchangers  
for  
Dry Kilns

B  
Chain  
Systems  
for  
Wet Kilns

C  
Unax Cooler Integral  
with Rotary Kiln

## F. L. SMIDTH & CO.

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ENGINEERS

NEW YORK, N. Y.

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← Early air compressor, driven by electric motor, delivering 125 cubic feet of air per minute through Thermoid hose for street railway construction.

→ To get an airport built, fast, a battery of giant Ingersoll-Rand compressors each delivers 500 cubic feet of air per minute through Thermoid Molded Air Hose No. 210. Note how small the mechanic seems beside this equipment.



Today's Thermoid Air Hose is tough. It stands up to flexing, pulsation-frequencies, pressures, hard knocks and abrasion that would quickly destroy the best air hose of a few years ago.

Thermoid's improvements in air hose should interest you, for they are typical of the way we contribute to industrial progress. Through the years Thermoid has matched the ingenuity of engineers and inventors. Making available constantly improved industrial rubber products, we have helped them translate their ideas and

blue-prints into equipment able to perform faster and more efficiently.

Consult your Thermoid Representative about your problems. Like so many, you may find, "It's Good Business to Do Business with Thermoid."

Send for our latest Air and Welding Hose Folder #3728—just off the press!

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DIVISION OF THERMOID COMPANY

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*Contributor to Industrial Advancement Since 1880*







## GENERALLY SPEAKING

(Continued from page 32)

A combined attack by four Federal Agencies on the black market in lumber and other building materials has been announced by Housing Expediter Wilson W. Wyatt, Attorney General Tom C. Clark, Treasury Secretary John W. Snyder, and OPA Administrator Paul A. Porter. The principal avenue of attack will be through the agents of the Internal Revenue Bureau of the Treasury.

\* \* \* \* \*

Highways are not only badly needed but the job creating opportunities in such construction and related occupations is considerable. It has been estimated that more than 400,000 workers will find employment as a result and that twice that number would be needed in 1948 or 1949 when highway construction reaches its peak. This is exclusive of repair and improvement to existing roads, streets and highways.

\* \* \* \* \*

There are a few generous breaks granted in labor relations after all. It has been ruled by the N.L.R.B. that an employer can prohibit union solicitation in his plant during working hours if the employer can prove that such stoppage was not designed to discriminate against union membership.

\* \* \* \* \*

Asbestos, celestite, corundum, graphite, mica, quartz crystals and steatite talc are industrial minerals to go into the government stockpile being accumulated for the next war.

\* \* \* \* \*

Ferdinand H. Rhoden of Chase Bag Co., who recently returned from India, reports that it is doubtful if burlap importations can be expected to eliminate the current textile bag shortage in this country. The acreage to be licensed by the Indian Government has been reduced by 25 per cent compared to last year in favor of rice and other food grains which are critically needed. However, jute crop prospects are fair, and with good weather the out-turn will not be much less than the current crop.

\* \* \* \* \*

The latest dope emanating from official Washington is that homes built in 1946 will closely approach the all-time volume of 1925. We wonder if they are counting all the homes we see around the country in various stages of completion that will still be that way because there wasn't enough lumber or other building materials to complete them.

\* \* \* \* \*

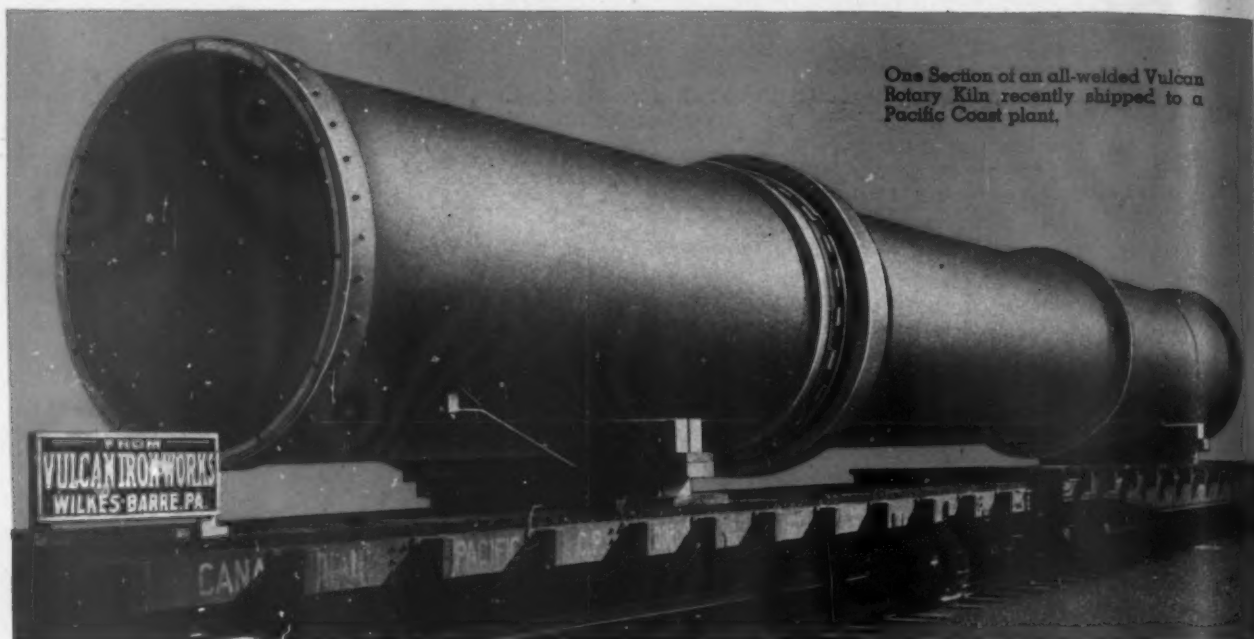
Employers must withhold part of back wages, for taxes, paid to employees under the Wage-Hour Law. Those payments are subject to withholding taxes.

\* \* \* \* \*

Federal authorities will continue to channel building materials into smaller homes. It has been ordered by the National Housing Agency that a minimum of 50 percent of building materials (priority) must go into minimum standard two-bedroom houses.

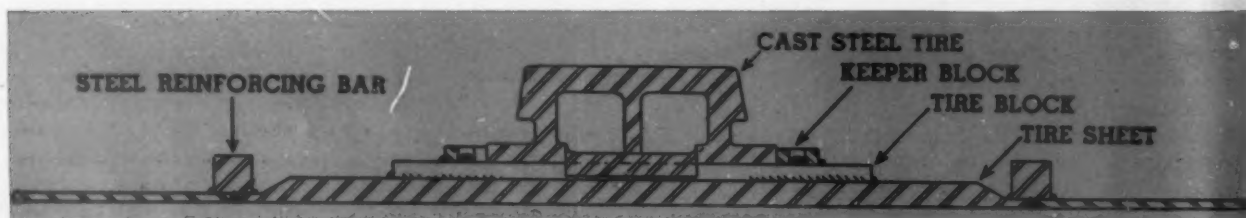
THE EDITORS

# BUILT FOR LOW-COST SERVICE



One Section of an all-welded Vulcan Rotary Kiln recently shipped to a Pacific Coast plant.

## ... With This Distinctive Rivetless Tire Mounting



The rivetless tire mounting diagrammed above is one important reason why Vulcan Rotary Kilns give good service at low operating cost. Creeping of the tire is permanently prevented by a distinctive combination of interlocking lugs and blocks. And the use of just **ONE THICK PLATE** beneath the tire, by improving heat conductivity, eliminates burning or bulging of the shell and reinforcing bands at this point.

This cost-cutting feature of Vulcan Rotary Kilns

typifies the "economy engineering" made possible by Vulcan's fifty years of continuous experience in the field. Vulcan service also includes the design, construction and equipment of **COMPLETE PLANTS** for the manufacture of cement, lime and allied products. Write us regarding any manufacturing or processing problems within the scope of the equipment listed below. Constructive suggestions are made without obligation, whenever possible.



# Vulcan Iron Works



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Rotary Kilns, Coolers and Dryers • Rotary Retorts, Calciners, Etc. • Improved Vertical Lime Kilns • Automatic Quick-Lime Hydrators  
Toothed, Double-Roll Crushers • Steel Castings • Steel Fabrication • Ball, Rod, and Tube Mills • Shaking-Chute and Chain Conveyors  
Heavy-Duty Electric Hoists • Scraper-Loading Hoists • Cast-Steel Sheaves and Gears • Steam Locomotives • Diesel and Gasoline  
Locomotives • Diesel-Electric Locomotives • Electric Locomotives and Larrys





# Editor's Page

## Increased Freight Rates Have Serious Implications

**A**N APPRECIABLE INCREASE in freight rates for aggregates—sand and gravel, crushed stone and slag—that may be granted the railroads in their proposal (Ex Parte 162) now before the Interstate Commerce Commission—could well result in serious competitive dislocations within the aggregates industry itself and invite unwanted and *undesirable* competition from without. The railroads probably are entitled to some rate adjustments but, should they receive an upward revision in rates approaching what they ask, they will find themselves further out-competed by other forms of transportation that have gradually been taking the play away from them during the past generation. They have requested a flat increase of 20 cents per ton for ordinary aggregates and still higher rates for flux stone and other stone products.

### Non-Commercial Competition

Should their request be granted, or even approached, a serious burden will have been added to an industry that already is saddled with freight rates that exceed, in many cases, or closely approach the value of the product itself. Delivered cost of these basic building materials is what interests the user and he, quite naturally, will purchase at the *lowest delivered price* or produce his own materials.

So-called non-commercial production, by agencies of government and by contractors serving specific projects, has been far too prevalent, particularly in the sand and gravel industry, and amounts to robbing the legitimate, qualified commercial producer of business that rightfully should be his. He has the knowledge and experience to produce a high-grade commodity. Some sorry stuff has been put out by makeshift non-commercial producers in the past and sometimes at costs that could have been proven far out of line if all elements of operating cost were considered.

There will always be a certain amount of non-commercial tonnage but nothing should be permitted to encourage its growth. Such diversion from the established sand and gravel industry amounted to 48 percent of the total in 1939, which is an unhealthy condition for the commercial industry and most certainly for the railroads. The fact that practically all of that tonnage moved by trucks is positive proof that high comparative transportation rates and probably, in part, the inconvenience and expense in re-handling, is licking the railroads insofar as revenue from aggregates is concerned.

The commercial producer isn't going to sit idly by either. He has his legitimate competitor to meet, however pronounced a trend might develop toward more local, state or federal government-competing operations. Total delivered cost to the purchaser will take on new meaning, where a comparative status quo has existed. Today's conditions of exorbitant wages and

other costs have forced him to plan plant rehabilitation for maximum overall productivity.

### Haulage and Distribution

This would mean little or nothing to the railroad shipper if he failed to follow through and consider distribution and transportation which, in the face of higher delivered prices, become an increasingly important part of his program to meet competition at the delivered price level.

Truck and water transportation from permanent plants will increase, and the extent of the transition from rail to other means of transportation will be determined by the relative efficiency and cost of these haulage methods. According to the brief, recently filed jointly by the aggregates industries through their national associations, in opposition to the requested increase in rail freight rates, 47.5 percent of the commercial tonnage of crushed stone for concrete and road metal and from commercial sand and gravel plants in 1933 was moved by rail. The figure dropped to 32.9 percent in 1940, a period of great improvements in truck haulage equipment. If non-commercial tonnage were included, some 70 percent is now moved by truck.

Obviously, there will be substantial further improvements in truck haulage equipment, mechanically overall and in size and in the efficiency of motive power, and it isn't difficult to imagine that there could develop intense competition between producers, operating their own fleets, that will be dependent upon the relative performance of their respective haulage equipment in trimming delivered prices.

There have been tremendous strides made in the development of efficient portable aggregates plants which are bound to figure importantly in decentralization of plant operations, whether or not freight rates are boosted considerably. Decentralization of plants, either by establishment of portables or stationary units of modest size, would be accelerated if higher freight rates are imposed. That has happened in the past with the result that the industry grew in number of plants but declined in average tonnages produced per plant. When large projected construction projects start, the stationary plant operator will require auxiliary plant facilities at remote localities in order to prevent great loss in volume to outside interests.

The railroads may indeed find they were shortsighted if they have the capacity and want to hold a source of revenue that amounted to over 60 million dollars in 1945.

*Bror Nordberg*

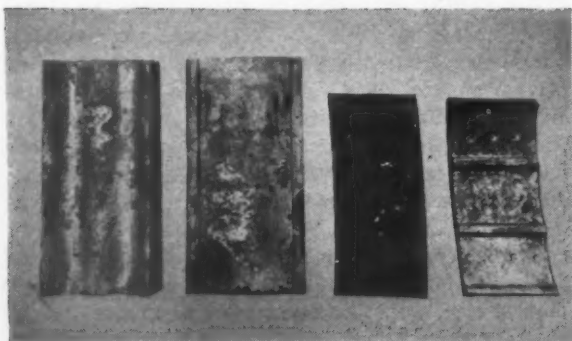
# Cast to LAST

on cement  
mill equipment

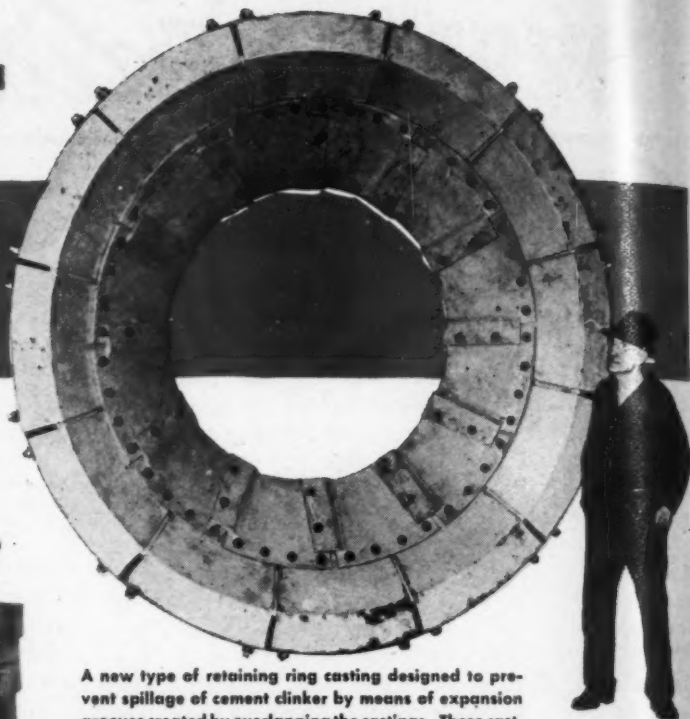
## B&W ALLOY CASTINGS



Cast rotary kiln feed pipes,  
7 1/2" O.D. x 9' 8 1/2" long, for  
a cement plant in Pennsylvania.



B&W Tube Mill Liner Castings.



A new type of retaining ring casting designed to prevent spillage of cement clinker by means of expansion grooves created by overlapping the castings. These castings are operated without any refractory protection.

**O**N A KILN where previous nose ring castings lasted but eight months, B&W Alloy Castings have stood up for three long years—and are good for several more!

Castings that give such lasting service under severe, high-temperature conditions, are a big help in reducing time-consuming repairs and replacement shut-downs.

B&W Alloy Castings—in practically any shape or weight—can be supplied in analyses to meet almost any set of requirements encountered in rock products equipment. They withstand service temperatures up to 2000 F., under conditions requiring high creep strength, consistent with long-time stability. They are produced in the modern B&W foundry, which is equipped with electric induction furnaces, heat-treating facilities, electric welding apparatus, and X-ray inspection equipment.

For castings that last, get in touch with B&W. The experience gained in helping others solve their equipment problems with B&W Alloy Castings is always available to you without obligation.



Water-Tube Boilers, for Stationary Power Plants, for Marine Service . . . Water-Cooled Furnaces . . . Superheaters . . . Economizers . . . Air Heaters . . . Pulverized-Coal Equipment . . . Chain-Grate Stokers . . . Oil, Gas and Multifuel Burners . . . Seamless and Welded Tubes and Pipe . . . Refractories . . . Process Equipment.

# BABCOCK & WILCOX

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85 LIBERTY STREET, NEW YORK 6, N.Y.



# Rocky's

## NOTES

Nathan C. Rockwood

### Optimists' View of Expansion

ON THIS PAGE in our July issue we discussed the present quandary of many rock products manufacturers and producers, in trying to decide whether or not to proceed now with proposed programs for expansion of production facilities in view of present costs of construction and machinery installations, which are probably nearly twice original estimates. We mentioned the National Gypsum Co. as one of the venturesome which had decided to make the plunge, even though in doing so it was compelled to seek much additional money through a new issue of 275,000 shares of common stock.

Since then we have received a copy of the semi-annual report of M. H. Baker, president of the company, to his stockholders, together with a reprint of his address to the Real Estate Board of Kansas City, Mo., on May 24, which provide the philosophy behind his decision to go ahead, regardless of factors which are deterring many other producers and manufacturers.

Like other manufacturers of the kind of building materials that found a ready use in the temporary war construction, the National Gypsum Co. was fairly prosperous throughout the war years. In addition it managed plants for the production of war necessities entirely outside its normal building materials lines. Hence, the company was well heeled financially for the anticipated post-war rehabilitation and expansion program. It had, apparently, accumulated surplus and resources to carry out a program, which, when completed, will about double its pre-war output. Then, like many other manufacturers similarly situated, it faced shortages and bottle-necks in construction materials and production machinery, with costs constantly rising, until now they are about double those anticipated.

#### Basis for Optimism

In his Kansas City talk Mr. Baker made the following points, which we have picked out as best representing

the philosophy back of his decision to act now. More production, quickly, will meet the threat of further inflation. Those who see danger of deflation from over production should consider the increased buying power of a much larger population. Higher wages and full-time employment have made a larger market with the so-called underprivileged, who in the past could buy only bare necessities.

The federal government's estimates of the need of perhaps as many as 1,500,000 homes a year for at least 10 years is considered conservative. In the largest pre-war construction year some 1,000,000 homes were built. The building of any such number of homes will in itself create prosperity because it stimulates buying of household furniture and utensils, automobiles, etc. All that is needed now is a sound government policy; which means chiefly stabilization of wages and prices, with a profit that will attract private capital and a full day's work.

#### Causes of Worry

Of course, there is the other side of the picture, which Mr. Baker did not neglect. Federal legislation has assumed that the principal obstacles to building housing for the populace are the inevitable weaknesses in the free enterprise system—that industry will not rise to its opportunities without government inducements—that cities cannot meet their fiscal problems without federal aid, and that an increasing number of families depend on the benevolence of government for shelter. These handicaps, Mr. Baker quite properly said, should stimulate the efforts of private industry rather than discourage them.

The \$10,000 house is too costly to meet the popular demand; so, the individually built house of the future while it will still be built by the methods now used, there will be more emphasis on the size of rooms (standardized) to accommodate standardized units. Homes built in groups by

operative builders will be planned to use a minimum of on-the-job labor. These builders will take advantage of pre-assembled equipment for kitchen, bathroom and the like. A pre-war \$6000 house should not cost now more than \$8500, which in view of a 50 to 75 percent increase in workers' incomes isn't excessive.

There must be an upward adjustment of prices on many building products to encourage production (that is as of May, 1946). There must be stabilization of labor throughout all industry to avoid shutdowns that reduce the supply of raw materials and vital plant equipment. There must be a system of priorities that will give building material manufacturers preference on equipment and materials for new plants, and that will give contractors preference on material-handling machines.

#### Profit Possibilities

The first six months of 1946 showed that earnings of the National Gypsum Co. were \$1,727,218 compared with \$519,559 for the first six months of 1945. Sales were up 15 percent, and because of shortages of labor, paper, steel and other things, full capacity of existing plants could not be utilized, and there is a large back log of orders. Under these circumstances the company sold to underwriters the 275,000 new shares of common stock for \$7,700,000. This figures out \$28 per share, which is about \$5 per share less than the stock had been selling for on the New York Stock Exchange, but is approximately the current price (as of Aug. 15).

Only time will tell whether or not this was a gamble, but it is a typical example of the problem facing every building material manufacturer, and the solution of that problem in this instance is by a man and a company who have had phenomenal success in guessing right through equally difficult times. For our own part, we still believe there will be a temporary setback, similar to that in 1920 and 21, before we shall have stable wage and price conditions, or a federal government with a commonsense view of fiscal problems. There is no reason to doubt, however, that the new plane of stabilized wages and prices will be permanently higher than ever before; and workers and employers alike must adjust their understanding to acceptance of actually less real income for a long time to come, because (a) the purchasing power of their dollars has been depreciated; (b) they are assuming the burden of carrying, and eventually paying off, an enormous public debt; (c) they are assuming the burden of carrying indefinitely a great army of public pay-rollers and pensioners. The costs of all this must be, and can be, paid for only by taking from those engaged in producing wealth—both workers and employers.



## PAGE FROM A BLASTER'S NOTEBOOK



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Taking full advantage of all the terrific energy packed into modern dynamite is no problem with PRIMACORD loaded holes. Imparting a powerful detonation to each cartridge it contacts, PRIMACORD gets that full efficiency from explosives, assures effective results time after time.

PRIMACORD accomplishes this with a maximum of safety for your men. Insensitive to any stray currents from electrified equipment or lighting, it's safer before the blast. And because PRIMACORD detonates every cartridge in the hole, its efficiency is proved after the blast.

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*Detonating* FUSE



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# Washington NEWS

**C**ONFRONTED with another year at least of O.P.A. regulation, the various branches of the rock products industry are seeking either suspension of control or price relief. The crushed stone industry has succeeded in having controls removed from fluxstone and rip-rap. Industrial sand controls were removed on July 26. However, industrial sand producers that supply sand for use in masonry construction or units of masonry construction must still submit to price control on that phase of the business.

Application has been made by the National Sand and Gravel Association for decontrols as of July 30. The first application dated September 27, 1945, was denied by O.P.A. on November 1, 1945. Executive Secretary V. P. Ahern has pointed out that the industry has a strong case, but the government is reluctant to suspend controls on any commodity which enters into the building of homes for veterans, even though only a negligible fraction of the industry's total output goes into homes. This policy also will apply to ready mixed concrete.

The new application is based on the more rigid criteria of the old law, but the new law establishes a more liberal policy of suspension of price control. For example, Sec. (d) states in part that "in no event shall maximum prices be maintained after December 31, 1946, for any non-agricultural commodity or class of commodities unless the same has been expressly found by the Administrator to be important in relation to business costs or living costs." When regulations under the new law are issued, the Association plans to submit a supplementary application to O.P.A. if by that time favorable action with respect to sand and gravel has not been taken.

Similar action is to be taken by the National Crushed Stone Association for crushed stone for aggregates and through the Agricultural Limestone Division for agstone. A factor making suspension of control difficult for agricultural limestone is that more than 50 percent of the production is on government contracts, and O.P.A. is not disposed to remove control without getting the assent of the Field Service Branch of the Production and Marketing Administration, Department of Agriculture.

## Ready Mix Prices Up

All producers located in the Louisville, Ky., area have been authorized

by O.P.A. to increase maximum prices to each class of purchaser by \$2 per cu. yd.

Ready mixed concrete prices in the Buffalo, N. Y., area have been amended by striking out the figures ".56" in the second line of column 7 on page 2 of Schedule A and inserting in place the figures ".99"; and by striking out the figures "1.80" in the second line in column 4 under Floor Topping Mixes on page 2 and inserting the figures "1.90"; and by striking out ".14" in the sub-division of column 5 on the second page of Schedule A under City Paving Mix, and inserting the figures ".46."

## Pricing Applications for Concrete Block Must Go to District OPA Offices

Applications for establishment of prices of new businesses, or for prices of new products, in the concrete masonry industry must be made to O.P.A. district offices rather than the national office, the Office of Price Administration has announced. This change of procedure was effective June 24, 1946.

All reports and applications, by this action, must be filed with the district director in the region in which the manufacturer's principal place of business is located. This action will speed up considerably the processing of applications for pricing these critical building materials.

## Gypsum Prices Modified

O.P.A. has changed maximum prices for sales of gypsum partition and gypsum hollow block as follows:

"Manufacturers' maximum prices for sales of 3-in. gypsum partition tile and 3-in. gypsum hollow block shall be an amount not in excess of 7 cents per sq. ft., f.o.b. the plant, when the following conditions are met:

"(1) The sale is made f.o.b. a plant located at New Brighton, New York; Wheatland, New York; and Philadelphia, Pennsylvania; and

"(2) Shipment is destined to points within the States of Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New York, New Jersey, Delaware, Pennsylvania, Maryland, and the District of Columbia, that portion of the State of West Virginia east of the western boundaries of the counties of Grant and Pendleton; and that portion of the State of Virginia north and east of the south and west boundaries of the

counties of Rockingham, Greene, Orange, Louisa, Hanover, Henry, Chesterfield, Prince George, Surry, Isle of Wight, Nansemond, Norfolk, and Princess Anne.

"(b) If the manufacturer had an established differential in price during March, 1942, between 3-in. sizes of gypsum partition tile and gypsum hollow block and other thicknesses and types of these commodities, he may convert the adjustment granted in (a) above for the 3-in. sizes so as to reflect his customary March, 1942, dollars-and-cents differentials between the 3-in. sizes and the other thicknesses and types of partition gypsum tile and gypsum hollow block."

## Up Lime Prices

Effective July 26, O.P.A. increased the price ceiling of lime \$1 a ton for producers east of Rocky Mountains. Resellers, except where under area pricing orders, may pass on the percentage increase.

## Increase Cement Package Prices in East and Texas

On July 26, the O.P.A. granted an increase to the manufacturers of cement in the State of Texas of 5c per barrel of cement when sold in containers over the March, 1942, prices. The same date the O.P.A. granted manufacturers of cement in Bureau of Mines Districts 1-8, inclusive, an increase of 5c per bbl. when packed in containers. With 20c increase previously granted, the total increase is 25c a barrel.

## Machinery Prices Going Up

Sellers of construction machinery and equipment who have been selling under interim price ceilings 10 percent above base prices in effect October 1, 1941, may continue to sell at these price levels according to a recent ruling of O.P.A. Some of the most important items of machinery which have been placed under decontrol are as follows: Ball mills, autoclaves, centrifuges, crushers, pulverizers, grinding and crushing rolls, concrete batching and weighing equipment used in connection with the production of concrete products, drills, hoists, mine loaders, and bag filling machines, pumps, and power transmission machinery. Screening machinery subject to RMPR 136 also is included.

# It's an INTERNATIONAL TD-18 DIESEL



## 15 TONS of PRODUCTIVE POWER!

• Your stripping operations need dependable, productive power. Here are 15 tons of it—INTERNATIONAL POWER—the rugged crawler you need for stripping operations.

It's no secret why INTERNATIONAL DIESEL CRAWLERS give you top-notch performance. They're engineered that way. Instant-starting, full-Diesel engines produce dynamic power. Better balanced weight—every pound placed for maximum tractive effort—delivers that power to drawbar and 'dozer blade where it goes to work.

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*punishment, needs less time for down time. INTERNATIONALs stay on the job!*

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# INTERNATIONAL

## Industrial Power

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# the *Personal Side* of the news

## Sales Manager

PURD B. WRIGHT, JR., who was recently appointed manager of the "Incor" division and technical service of Lone Star Cement Corp., New York, N. Y., has assumed the managership of the Ash Grove Lime and Portland Cement Co., Kansas City, Mo. Mr. Wright succeeds H. Ding Burton, who has resigned to accept the position of vice-president of the Swenson Construction Co.

## Geology Chairman

ARTHUR BEVAN, state geologist of Virginia, has been appointed chairman of the Division of Geology and Geography of the National Research Council, for the three-year term from July 1, 1946. He succeeds William W. Rubey, of the U. S. Geological Survey, whose term had expired.

## Resigns

LOUIS J. HOENIG, general manager of the Nebraska Cement Co., Omaha, Nebr., has resigned from the company and moved to Los Angeles, Calif., where he and Mrs. Hoenig will make their home.

## Marquette Promotions

FRANK MOYLE, general superintendent of the Marquette Cement Manufacturing Co., Chicago, Ill., has been promoted to director of operations. Mr. Moyle has been responsible for many improvements in cement manufacturing processes during his 33



Frank Moyle

years with the company. GEORGE L. KIRP, prominently associated with the cement industry for many years, has been appointed operations engineer, and WILLIAM E. ERWIN, formerly



George L. Kirp

director of labor relations for North American Aviation, Inc., Kansas City, Kans., has been made assistant manager of industrial relations.

## Mining Commissioner

DR. FRANCIS C. LINCOLN, state inspector of mines for South Dakota, has been appointed a commissioner on the South Dakota Natural Resources Commission and is at present engaged in writing pamphlets on the state's mineral resources. Dr. Lincoln also acts as part-time professor of mining at the South Dakota School of Mines and Technology. Several articles by Dr. Lincoln on the rock products industry of South Dakota appeared in *ROCK PRODUCTS* in 1927.

## Manages Gypsum Firm

LEONARD L. HANK has been appointed manager of the Western Board and Paper Co. plant at Kalamazoo, Mich., which has been taken over by the National Gypsum Co.

## N.C.M.A. Chairman

JAY C. EHLE, production manager of the Cleveland Builders Supply Co., Cleveland, Ohio, has been appointed chairman of the newly organized committee on manufacturing and technical problems of the National Concrete Masonry Association, Chicago, Ill. Among the many problems

requiring the attention of the new committee are the development of methods of minimizing shrinkage cracking in concrete masonry walls, rapid and economical curing methods, design and construction of kilns, and new uses and new markets for concrete masonry units and precast concrete products. The committee consists of the chairmen of the Aggregate Divisions and the Committee on Curing Methods together with members appointed by Deane R. Lynde, president of the N.C.M.A.

## New Directors

HORACE C. KRAUSE, vice-president, Columbia Quarry Co., St. Louis, Mo., has been elected a member of the board of directors of the National Crushed Stone Association, succeeding his father, E. J. Krause, who is seriously ill. "E. J." was one of the founders, and one of the earliest presidents of the association, and has been a member of its board ever since its organization. He has two sons active in the company, Charles and Horace. Horace has come up through the sales department, being now vice-president in charge.

A. BATTLE RODES, vice-president of the Franklin Limestone Co., Nashville, Tenn., has been elected a member of the board of directors of the National Crushed Stone Association, succeeding his father, H. E. Rodes, who is a past-president of the association. Mr. Rodes, senior, is in excellent health and is still active as president of his company, but is enjoying life as a country gentleman, while the younger generation is taking over.



Horace C. Krause

## Carney Officials

N. A. HOLMER, formerly general sales manager of The Carney Co., Minneapolis, Minn., has been ap-



N. A. Holmer

pointed vice-president in charge of sales of the merged Carney industries with the Carney Rock Wool Co., which will now be known as The Carney Company, Inc., with headquarters in Minneapolis. HARRY E. CARNEY, Jr., is president of the new corporation. J. W. MOORE, assistant vice-president of Archer-Daniels-Midland Co., St. Paul, Minn., has been named to the board of directors. Mr. Holmer is vice-president of the Industrial Mineral Wool Institute of New York, and a member of the board of directors and chairman of the planning committee of the National Mineral Wool Association, New York, N. Y.



W. B. Lee

Other officers and directors include W. B. Lee, executive vice-president, treasurer and general manager; T. P. Walters, vice-president; K. A. Gollmar, secretary and assistant general manager; F. A. Buscher, George Pass, Jr., and H. M. Preston, directors.

President Carney is the grandson of P. H. Carney, who founded the original unit of the Carney Industries in 1883, and the son of Harry



Harry E. Carney, Jr.

E. Carney, who expanded and developed the industries until his death in 1938.

## A. I. Engineer

EDWARD M. HOWARD has been appointed district engineer in the Boston office of The Asphalt Institute, New York, N. Y. Mr. Howard, who received his B.S. degree in civil engineering from the Massachusetts Institute of Technology, was recently released from the Seabees with the rank of Commander. He entered the Navy in 1942 and was in charge of airport construction on one of the Pacific island bases. When discharged he was maintenance superintendent of the Public Works Department at the Boston Navy Yard. Mr. Howard has had a long and varied experience in highway and airport construction, and for a number of years was resident engineer with the Illinois Department of Highways.

## Member of U.S.C. of C.

HOWARD F. PECKWORTH, managing director of the American Concrete Pipe Association, Chicago, Ill., has been appointed a member of the National Council and the Construction Industry Advisory Council of the U. S. Chamber of Commerce.

## Exhibit Director Retires

L. W. SHUGG, known to all who have attended conventions of the National Crushed Stone, National Sand and Gravel and National Ready-Mixed Concrete Associations as the manager of exhibits, and ex-officio member of the first two associations' boards of directors, has reached the retirement age for General Electric Co. employees. Consequently, he is resigning his membership on the boards of directors of the two national associations.

Mr. Shugg has handled the convention and exhibit work of the General Electric Co. for 35 years, and his service with the company covers 45 years. In recognition of this long and valuable service he was awarded the Certificate of Merit of the Charles A. Coffin Foundation, established by the General Electric Co. for the encouragement of signal contributions by employees of the company toward the increase of efficiency or progress in the electrical art. The award was made in recognition of the unusual toil and resourcefulness of the recipient as a director of exhibits for G.-E. and other companies at annual industrial conventions.

Although most members of the aggregate associations know Mr. Shugg, probably few know how extensive his interests in industry exhibits has been. In addition to his handling of the exhibits of these associations, he has done the same kind of work for the American Mining Congress, the National Electric Light Association, National Electrical Manufacturers' Association, National Railway Appliance Association, and numerous others. He is probably the most experienced manager and promoter of exhibits of industrial equipment in the world, through the courtesy of his employer, the General Electric Co., who gave him a free rein.



L. W. Shugg

## With Ready Mix Concern

GEORGE HERBST, JR., long associated with the Mississippi River Sand and Material Co., St. Louis, Mo., left that



George Herbst, Jr.

company last June to become associated with the Central Concrete Co., a newly-formed ready-mixed concrete company, also of St. Louis.

## Plant Engineer

RALPH REINER has been appointed plant engineer for the concrete products plant of the Cleveland Builders Supply Co., Cleveland, Ohio. Mr. Reiner, a graduate mechanical engineer from the Case School of Applied Science, recently completed three years of service in the U. S. Navy where he served as an officer on an aircraft carrier in the Pacific, with a rating of lieutenant (j.g.) when discharged. JAY EHLE, prominently



Ralph Reiner

identified with the industry and affairs of the National Concrete Masonry Association, is now production manager for all manufacturing operations of the Cleveland Builders Supply Co.

## Retires

ED IRVIN, manager of the Blue Rapids, Kans., plant of the Certain-teed Products Corp., Chicago, Ill., has retired after more than 48 years of service with the company. KENNETH W. BROWN, who has been employed at the Fort Dodge, Iowa, plant, will succeed Mr. Irvin as manager at Blue Rapids.

## Assists President

E. F. HABERKERN is now assistant to E. J. Krause, president of the Columbia Quarry Co., St. Louis, Mo. Com-



E. F. Haberkern

plete details of his appointment appeared in the July issue of ROCK PRODUCTS.

## General Manager

DON JOHNSON, formerly manager of the Bellamy Sand and Gravel Co., Correctionville, Iowa, has been named general manager of the Ready Mix Concrete Co., Sioux City, Iowa.

## Housing Director

ROSS A. GRIDLEY, formerly director of the Fixed Installation Division of the Foreign Liquidation Commission of the State Department, Washington, D. C., has been appointed director of the Construction Branch of the National Housing Agency, according to an announcement by Housing Expediter Wilson W. Wyatt. Mr. Gridley and his staff of 35 con-

struction engineers will advise builders as to construction methods in the use of new materials designed to reduce costs and save scarce materials; also assist and advise in the erection of prefabricated houses.

## OBITUARIES

FRANK E. DAVIS, secretary-treasurer of the National Gypsum Co., Buffalo, N. Y., passed away July 26 at the age of 60. He had recently returned from a vacation and had remarked to associates that he was feeling in the best of health. Mr. Davis formerly was an official of the Beaver Board Co. which was later purchased by the Certain-teed Products Co. When the National Gypsum Co. was formed in 1926, Mr. Davis joined it as assistant to the president. In 1929 he became secretary-treasurer.

JOSEPH M. PUSEY, general manager of the Wilmington Division of the Warner Co., Philadelphia, Penn., died recently at the age of 66. His first job was with Joseph Bancroft & Sons, where he worked for 20 years. Then he joined his brother to form the Edward R. Pusey Co., becoming president in 1926. It was through the merger of this company with Warner Co. in 1930 that he became general manager of the Wilmington division.

F. E. BRECKENRIDGE, president of F. E. Breckenridge Material Co., Webster Groves, Mo., passed away July 11. He was 44 years old. An ardent sportsman and hunter, Mr. Breckenridge had been active in the industry for the past 20 years.

JOHN T. HEFFERNAN, former owner and president of the Glacier Gravel Co., Seattle, Wash., passed away recently at the age of 80. At the time of his death Mr. Heffernan was president of the Heffernan Investment Co. He had been in semi-retirement for the past three years.

WILLIAM PATRICK NEWMAN, retired purchasing agent of Robins Conveyors, Inc., division of Hewitt-Robins, Inc., died July 17 after a short illness. He had been with the company for 47 years.

O. C. HART, chief chemist of the Monolith Portland Cement Co., Los Angeles, Calif., passed away recently. He had been with the company since 1932.

NICKOLAS HAUSER, operator of a stone quarry at Sherwood, Wis., died at his home July 14. He was 65 years of age and had been operating the quarry for the past 35 years.

IRIE BROWN, quarry superintendent of J. & L. Snouffer, Inc., Dublin, Ohio, died recently.





# Prevent Rust

**O**N THE JOB or in the yard, contractors' equipment of all types needs protection against rust. *Texaco Rustproof Compound* assures *positive* protection. It is easy to apply, long lasting and economical.

*Texaco Rustproof Compound* fights rust three ways. It 1) prevents rust from forming; 2) penetrates existing rust and stops further rusting; and 3) loosens existing rust, makes it easy to remove.

*Texaco Rustproof Compound* forms a soft, self-healing, *waterproof* film — easy to brush on, easy to remove. A single application usually protects for a whole year. Because of its proved effectiveness, *Texaco Rustproof Compound* is widely used wherever metal is subject to rust and corrosion.

Order *Texaco Rustproof Compound* from the

nearest of the more than 2300 *Texaco* distributing plants in the 48 States. Write for your copy of our 36-page book "Rust Prevention." The *Texaco* Company, 135 East 42nd Street, New York 17, N. Y.

## MANY USES FOR TEXACO RUSTPROOF COMPOUND

Metal construction equipment of all kinds, also gas holders, water works, sewage disposal plants, bridges — wherever metal is exposed to weather or corrosive chemicals and fumes — *Texaco Rustproof Compound* provides safe and economical protection. For example —

A Pennsylvania County Commissioner writes: "We have been using your *Rustproof Compound* for the last two years to protect our bridges in this County. Up to this writing we have coated some seven or eight bridges with splendid results. In the near future we intend to coat more of the bridges here."



# TEXACO Rustproof Compound

TUNE IN THE TEXACO STAR THEATRE WITH JAMES MELTON EVERY SUNDAY NIGHT — CBS



## OF THE INDUSTRY

### Marquette Improvements

MARQUETTE CEMENT MANUFACTURING Co., Chicago, Ill., has announced a big postwar reconstruction project in the modernization of the storage and shipping departments at its Hawkeye plant in Des Moines, Iowa. Work to be carried out this year will include new storage silos with a capacity of 216,000 bbl.

In 1947, two new packing plants and one bulk loading plant will be built. An innovation in the sack handling department will be the use of pallets on which sacks can be moved about, stored and reclaimed by self-propelled carrying and stacking trucks. Also to be installed will be automatically timed sack cleaning devices, an adaptation of machinery conceived and perfected by Marquette personnel at its plant in Oglesby, Ill. This work is, in effect, the resumption of a modernization program for the Hawkeye plant which was begun just before the war. Descriptions of modernization of this plant up to date have appeared in *Rock Products*, the most recent article being published in the August, 1946, issue.

### Tractor-Trailers in Mine

COLUMBIA QUARRY Co., St. Louis, Mo., has installed new haulage equipment at its Valmeyer, Ill., plant, consisting of three TR15 Easton trailers pulled by U-90-T Autocars. Replacing haulage equipment of smaller capacity, a pay load of 22 tons is hauled by the new tractor-trailers

from the mine to the primary crusher. Autocars haul the heavy load over a grade that requires more than normal power. The Model U-90-T Autocar, which has a standard 109-in. wheelbase, is powered by a No. 501 six-cylinder engine rated at 48.6 A.M.A. hp. With a 501-cu. in. displacement, the output of the engine is 165 B.H.P. at 2700 r.p.m. The five-speed transmission is mounted as a unit with the gasoline engine. Installation of this equipment was made in June, 1946.

Later this year, a type 11 BU-151 Joy loader will be installed at the Prairie du Rocher, Ill., mine, operated and owned by Columbia Quarry Co. Three conventional Model C-90 Autocars and three Easton trailers also will be placed in service.

### Texas Newest Cement Plant Project

ERLE P. HALLIBURTON, president of Halliburton Oil Well Cementing Co., has announced that the Tex-Mex Cement Co. will be organized under the laws of Delaware. Machinery for the plant has been acquired from the War Assets Administration by Erle P. Halliburton, Inc., and the equipment will be moved from East St. Louis, Ill., to the Nueces Bay area in Corpus Christi, Texas, or another suitable location within the vicinity. The corporation will have a capitalization of 40,000 shares of no par value stock, all of which will be owned by Erle P. Halliburton, Inc. Officers of the new company have not been

selected, but the company probably will be headed by Erle P. Halliburton as president, and Cedric Wilson, formerly with Trinity Portland Cement Co., will be vice-president and plant manager. No stock will be sold to the public, according to present plans.

### Produce Aggregate for Block

GRANITE SAND AND GRAVEL Co. started operations on the South River Road near Zanesville, Ohio. This company, which has been making concrete block at the site for some time, plans to produce its own sand and gravel. It is owned by Walter and Clyd Beisser who also operate a plant at Duncan Falls.

### Open Gravel Plant

ELLIS WEBSTER, Leadville, Colo., has opened a new plant which will wash and screen gravel and will produce crushed stone for aggregate. The plant is located at the old Valentine gold mill, some of the equipment of which will be used in the aggregates plant. It also is planned to start a cinder concrete block plant in the near future.

### Milwaukee Gravel Prices

UNIFORM PRICES of washed sand and gravel in Milwaukee, Waukesha and Ozaukee counties were established August 3 by the Milwaukee O.P.A. office. The maximum delivered price is \$1.55 per cu. yd., and the top pit sales price is \$1 per cu. yd. All producers will receive some price adjustment to regain the cost of increased wages granted and approved by the wage stabilization board.

### Reactivate Old Quarry

HI-TEST STONE Co., Plainfield, Ill., has opened up an old quarry property two miles northeast of this city which had not been worked for many years. Most of the production will be agricultural limestone. Plans call for eventual production of over 600,000 tons annually.

### Change Silica Owners

MILLVILLE SILICA SAND AND GRAVEL Co., Inc., Port Elizabeth, N. J., has been sold by Daniel Passarelli to new owners who will continue to operate under the old name. New owners and officers are: Dr. Chas. E. Sharp, president and treasurer; Lewis Fitzgerald, vice-president and general manager; and Mrs. Eva M. Sharp, secretary.



Tractor-trailer of 22-ton capacity being loaded in limestone mine

## Open Rock Wool Plant

PACIFIC ROCKWOOL Co. will open a rock wool plant near Dishman, Wash. The company will be associated financially with the Carney Co., Inc., Mankato, Minn., operators of a rock wool plant at that location. Cheap power and accessibility to raw materials decided the location of this plant. Raw materials will be shipped from Salt Lake City or Montana, either slag from blast furnaces or copper mill slag. The plant will have an output of about 20,000 tons of rock wool.

## Georgia Agstone Plant

GEORGIA LIMESTONE AND CHEMICAL Co., Sandersville, Ga., is the name of a new company which will open a quarry near this city and erect a plant. The deposit is said to contain 13,000,000 tons of stone with a 92 percent average test for calcium carbonate content. Henry Brandon is head of the company.

## Start New Agstone Unit

J. H. PETERSEN and HARRY GREEN, partners in a stone crushing business with headquarters at Greene, Iowa, recently placed in service a new type portable plant which replaces the Diesel-electric permanent plant which was destroyed by fire. A second portable plant has been in operation at Shell Rock, Iowa. Several other quarry locations in the vicinity have been leased by the partners.

## Moves Gravel Plant

BOYD GRAVEL Co., Coshocton, Ohio, has moved its plant to a new 15-acre site near this city. Bert Boyd is owner and manager of the former Adams Bros. gravel pit on Warsaw road. His son, Eugene D. Boyd, has become a partner in the business.

## Open Gravel Pit

STERLING SAND AND GRAVEL Co., Sterling, Kans., has purchased 40 acres southwest of this city, and will open a sand and gravel plant as soon as machinery can be obtained. A. F. Brown and Jake Hauschild represented the company in the transaction.

## Reorganize Quarry

SCOTT LIMESTONE QUARRIES, Hillsboro, Ohio, with plant at Danville, has been organized as a partnership by Nathan R. Scott, Hazel S. Scott, and James B. Gall.

## Limestone Sand Deposit

THE BUREAU OF MINERAL RESEARCH of Rutgers University recently announced the discovery of a deposit of approximately 700,000 tons of limestone sand with 73 percent calcium carbonate content. Dr. F. E. Bear of the New Jersey Agricultural Experi-

ment Station estimated the limestone sand could be reclaimed with shovels and sold from \$1.35 to \$1.85 a ton.

## "No-Accident Month"

STANDARD LIME AND STONE Co. recently opened its "no-accident month" campaign with a special program at its Millville, W. Va., plant. Speakers included John J. Porter, chairman of the board, North American Cement Corporation; Daniel Baker, Jr., president of the Standard company; and F. C. Thomas, general superintendent. There was special music, distribution of safety mirrors, candy and cigarettes to all employees. A flag-raising ceremony, including the raising of the American flag followed by the safety flag.

## Oppose Ready Mix Plant

UTAH SAND AND GRAVEL Co., Salt Lake City, Utah, is planning to erect a concrete batching plant in the Sugarhouse district. However, some opposition to the project developed from local residents.

## From Pipe to Ready Mix

DINUBA CEMENT PIPE WORKS, Dinuba, Calif., has added batching plant facilities for the production of ready mixed concrete. Clarence Gray, owner, will be assisted by his two sons.

## Small Cement Price Rise

MARQUETTE CEMENT MANUFACTURING Co., Chicago, Ill., in a recent series of local newspaper advertisements pledged this company and its subsidiary, Hawkeye Portland Cement Co., to keep prices strictly in line with costs of manufacture and delivery regardless of the future of government price control. It was pointed out that during the past two years, under OPA ceilings, the whole-

sale price of cement made by these companies rose a maximum of 10 percent over the prewar figure. In the six-year period between August, 1939 and August, 1945, cement prices increased 8.9 percent, well under the average of all building materials which increased more than 30 percent in the same period.

## Reopen Quarry

BOONE QUARRIES, INC., is the name of a new company which will reopen the quarry formerly operated by John N. Fellows at Columbia, Mo. About 500 tons of crushed stone will be produced daily. Plant expenditures will be about \$50,000. Partners in the enterprise are former Navy Lieut. Jack P. Hackethorn and Seabee Jack W. Terrill and Harold E. Johnson.

## Buys Block Business

ROBERT H. MILLER, sales manager of the Ebaloy Foundries, Rockford, Ill., has purchased the concrete block business of Herbert Baumbach in Janesville, Wis. Robert Miller, Jr., will operate the business.

## Limestone Plant

LIME ROCK Co., recently leased a site from the Bellingham, Wash., Port Commission for the purpose of erecting an agricultural limestone crushing plant. The stone will be brought in by boat for crushing. It is planned to spend \$30,000 on plant facilities.

## Concrete Plant

CONSTRUCTION MATERIALS Co., St. Louis, Mo., has started production of ready-mixed concrete at a new plant in St. Louis. The plant consists of a six-compartment, 1000-ton capacity aggregate bin, a two-compartment, 2025-bbl. bulk cement bin, a 5-cu. yd. weigh batcher, and bucket elevators.

## Buy Gravel Pit

EMIL OLSON, Baudette, Minn., has purchased the gravel and trucking business of Frank Green, Jr., the deal including a 40-acre tract in Spooner township containing a gravel pit, loading equipment, trucks, etc.

## Ready Mix Plant Opens

WESTERN PRODUCTS Co., Ft. Scott, Kans., has placed in operation its new ready mixed concrete plant, according to Harley T. Brown, manager.

## Sell Phosphate Properties

SOUTHERN PHOSPHATE CORPORATION, New York, N. Y., has sold its remaining phosphate properties to Davison Chemical Co. for \$3,600,000.

## Buy Gravel Business

ART SCHMIDT, Janesville, Wis., has purchased the sand and gravel business of Glenn Nichols.

## OPA or no OPA

PRICE OF MARQUETTE CEMENT WILL REMAIN REASONABLE

The facts are these:

DURING the past two years, under OPA ceilings, the wholesale price of delivered Marquette cement rose a maximum of 10% over the prewar figure. Most recently, a government-approved increase in freight rates forced the price of our product up another 1% to 1.5% to cover increased cost of delivery.

BEFORE OPA, agreed on June 19th it had prepared for release on July 1st an advertisement to increase charges by 1% per barrel on shipments in cloth or paper sacks. Marquette on date has not established this additional charge, despite the fact that current package charges are far below cost.

OPA also had begun to study the need for another increase in price on cement delivered in excess of 100 miles, granted only this year, and for increased cost of fuel and other items following the nation-wide coal strike. This study undoubtedly would have shown and for another 10% increase.

WELL, it seems further increase in price seems inevitable under these circumstances, any increase, by as well be held in the amount needed to pay for added fuel costs—certainly no more than would have been produced by OPA itself.

Therefore:

OPA or no OPA, we of Marquette pledge ourselves to meet every intelligent economy so that the same standard Marquette quality cement will be available to all at the lowest possible price.

Fair pricing is our policy—always.

July 15, 1946

MARQUETTE CEMENT  
MANUFACTURING COMPANY



Cement company advertises "hold-the-line" cement prices



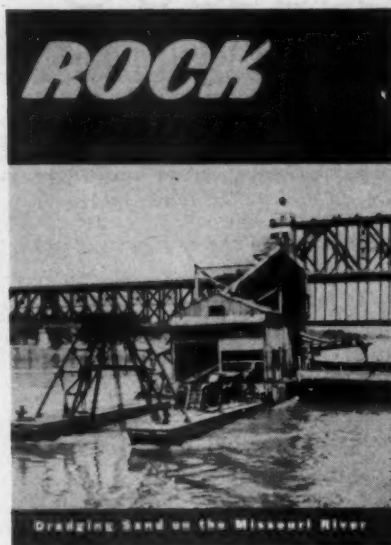
## Oregon Expansion Program

THE OREGON PORTLAND CEMENT CO., Portland, Ore., has an expansion program under way, which will increase the capacity of its plant at Oswego, Ore., from approximately 1,200 bbl. per day to a daily output of 3,000 bbl. of portland cement.

This program involves the installation of a 9- x 8- x 9- x 287-ft. kiln which is being furnished by F. L. Smith & Co., New York, N. Y. New machinery will be installed for an entirely new and modern cement manufacturing unit in addition to the company's present operations at that plant. This will include additional railroad spurs, raw grinding department buildings and machinery, and new slurry storage basins. The dust collecting department will include a new Cottrell precipitation collector to

serve both the old and new kilns. Induced draft fans and chain system will be used in both the old and the new kilns. The kiln department will have Unax coolers and the latest in controlling and weighing devices. The finishing department will include new compartment mills, elevating and conveying equipment. Dust collecting devices will be installed in the packing department. The total investment in this new unit will involve an expenditure in excess of \$1,000,000.

The product from this plant will be used to take care of the heavy demand for cement in this area, and at the same time will relieve the shortage of cement in Idaho and eastern Oregon by making available to that area the entire output of the company's plant at Lime, Oregon, situated near the Idaho border. The company officials believe that this additional output of approximately 2,000 barrels per day will supply the demand both in its coastal area and in the State of Idaho.



Cover picture shows dredge operated by Stewart Sand & Material Co., on Missouri River

## COMING CONVENTIONS

**American Institute of Mining and Metallurgical Engineers, 75th Anniversary Meeting, Waldorf-Astoria Hotel, New York, N. Y., September 16-18, 1946.**

**National Concrete Masonry Association, Convention and Exposition, Hotel Sherman, Chicago, Ill., week of February 17, 1947.**

**National Crushed Stone Association, Annual Convention, Edgewater Beach Hotel, Chicago, Ill., January 27-29, 1947; Agricultural Limestone Division, January 30-31, 1947.**

**National Industrial Sand Association, Fall Meeting, Edgewater Beach Hotel, Chicago, Ill., October 24-25, 1946.**

**National Safety Congress and Exposition, Stevens Hotel, Chicago, Ill., October 7, 1946.**

**National Ready Mixed Concrete Association, Annual Meeting, Biltmore Hotel, Los Angeles, Calif., week of March 3, 1947.**

**National Sand and Gravel Association, Annual Convention, Biltmore Hotel, Los Angeles, Calif., week of March 3, 1947.**

## Cement Production

BUREAU OF MINES reports that production of finished cement during May, 1946, totaled 12,172,000 bbl. or 51 percent greater than that reported for May, 1945. Shipments of 16,083,000 bbl. were 73 percent greater than those reported for the corresponding month of 1945. These figures indicate a continued strong recovery in both output and shipments. Mill stocks on May 31 were 24 percent lower than at the end of April, 1946, and 38 percent lower than a year ago.

The following statement gives the relation of production to capacity, and is compared with the estimated capacity at the close of May, 1946, and of May, 1945.

### RATIO (PERCENT) OF PRODUCTION TO CAPACITY

	May 1946	May 1945	Apr. 1946	Mar. 1946	Feb. 1946
The month..	59.0	40.0	64.0	55.0	50.0
12 months..	52.0	39.0	50.0	48.0	46.0

## Final Gypsum Figures

BUREAU OF MINES figures on gypsum and gypsum products for 1945 show increases for both mined and calcined gypsum despite price difficulties and shortages of labor and materials. Receipts of Canadian gypsum, for use in plaster and wallboard plants on the Atlantic seaboard, were the highest since 1941 but below pre-war levels.

However, the report for the first quarter of 1946, released July 24, showed the apparent new supply of crude gypsum in the United States was 39 percent greater than during the corresponding quarter of 1945. Recovery in output of base coat plaster and lath was notable, but the demand for lath and wallboard still exceed supply by several hundred percent. Statistics of the gypsum industry in the United States for the period from 1942 to 1945, inclusive, are as follows:

	1942	1943	1944	1945
Active establishments <sup>1</sup> .....	90	85	77	75
Crude gypsum <sup>2</sup> :				
Mined, short tons .....	4,697,568	3,877,541	3,761,234	3,811,723
Imported, short tons .....	394,460	231,323	342,462	508,762
Apparent supply, short tons .....	5,092,028	4,108,864	4,103,696	4,320,485
Calcined gypsum produced <sup>3</sup> :				
Short tons .....	3,045,082	2,557,730	2,363,143	2,485,090
Value .....	\$16,403,068	\$14,751,587	\$13,841,399	\$14,473,566
Gypsum products sold <sup>3</sup> :				
Uncalcined uses:				
Short tons .....	1,514,913	1,233,727	1,056,276	1,147,797
Value .....	\$3,533,607	\$3,114,789	\$2,953,564	\$3,432,727
Industrial uses:				
Short tons .....	142,705	163,500	200,473	157,796
Value .....	\$1,840,927	\$2,258,981	\$2,550,649	\$2,326,363
Building uses:				
Value .....	\$57,796,210	\$53,722,762	\$50,196,006	\$54,389,504
Total value .....	\$63,170,744	\$59,096,532	\$55,700,219	\$60,148,594
Gypsum and gypsum products:				
Imported for consumption...	\$508,321	\$304,154	\$394,603	\$548,697
Exported .....	\$977,863	\$283,720	\$489,980	\$1,502,668

<sup>1</sup> Each mine, plant, or combination mine and plant is counted as 1 establishment.

<sup>2</sup> Excludes byproduct gypsum.

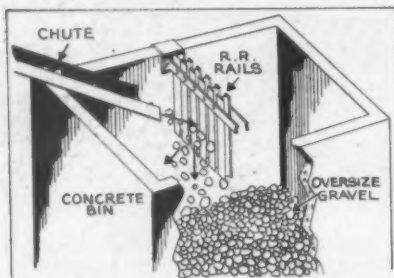
<sup>3</sup> Made from domestic, imported, and byproduct crude gypsum.

# HINTS *and* HELPS

PRACTICAL IDEAS DEVELOPED BY OPERATING MEN

## Unusual Baffle Plates

ST. LOUIS MATERIAL AND SUPPLY Co., St. Louis, Mo., has installed short sections of railroad rails to act as breaker plates and to prevent damage



Steel rails serve as baffle plates to prevent damage to concrete gravel bin

to the concrete walls of a gravel bin. Oversize gravel, sent by chute from screens, attains a velocity that would carry it across the bin and hit the concrete wall. To prevent this, railroad rails have been hung from the top of the bin directly in the path of the gravel. The gravel hits the rails and drops down into the bin before reaching the wall. The accompanying sketch illustrates this novel arrangement.

## Turntable for Trucks

AT THE CRUSHED STONE PLANT of Stewart Sand and Material Co., Independence, Mo., a turn-table permitting trucks to dump into railroad cars has been constructed from an old steam shovel turntable. The turntable of the steam shovel, left on its original wheels, was mounted on four concrete piers, as shown in the accompanying illustration, and power



Old steam shovel turntable converted to electric power is used to turn trucks 90 deg. to dump into railroad cars

was converted from steam to electric. Above the table, four I-beams were installed to support the wooden flooring above. A ramp built up to the flooring permits trucks to drive up forward. The table is then turned through a 90-deg. arc, allowing the trucks to discharge into the adjacent railroad cars, and when the trucks are empty, the table is turned another 90 deg., thus allowing the truck to drive forward again, down the ramp. The turntable is operated by a 9½-hp. motor.

## Scaffolding for Kiln Repairs

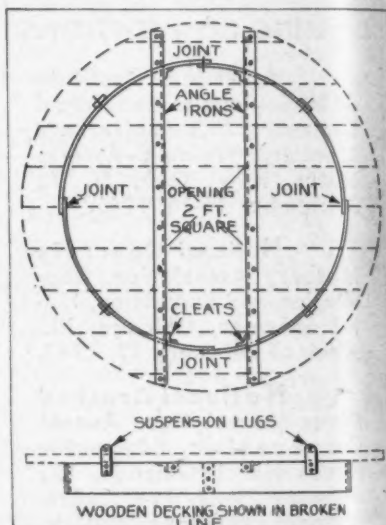
IN BUILDING, repairing, or demolishing the linings of vertical lime kilns, experience has shown that if the work is to proceed smoothly and economically, a satisfactory type of working platform must be provided. Scaffolding for use inside a narrow kiln must generally be constructed of pieces which can be handled easily in the limited space available. The nature of the work to be carried out will to some extent, govern the choice of arrangement. The following suggestions are based on practical experience.

The type of suspended platform illustrated has proved to be practicable, safe, and suitable for any kind of work in a parallel, circular kiln. It is constructed of a ring of ¼- x 9-in. M.S. plate on edge, made in quarters with bolted joints, each section carrying a suspension lug. The circle is stiffened by two 3- x 3- x ¾-in. M.S. angles, notched in flush with the top edge and cleated to the plates. The angles are drilled to take bolts for securing the deck planks, and an opening can be provided at any convenient point between them by stop-

ping the planks suitably. Erection marks are painted on the steel and cut into the planks.

This platform was designed to be suspended from the kiln top by four ¾-in. wire ropes ending in sets of two-and-one hemp rope blocks attached to the suspension lugs. By this arrangement, the workmen on the scaffold can themselves adjust their position through a height range of say, 10 ft., and by alteration of the wire ropes when necessary, the required height is covered.

For demolition work, which usually proceeds at a rate many times that of construction, this platform may be suspended by a long rope cluster to a single rope attached to a hand



Details of scaffolding platform

winch, by manipulation of which the platform can be lowered as is necessary. This arrangement does not provide as steady a working stage as does the four rope system, but it is quite practicable for the type of work referred to.

For any work other than demolition, plain-ended tubular scaffolding of the type used in building construction has proved to be remarkably useful and adaptable.

It can be used in lengths suitable for site conditions and can be erected either before work on the lining commences or as it proceeds. Where it can be arranged, it will be found an advantage to use one common length of tube for both uprights and horizontals. For example, a circular kiln of 9 ft. internal diameter can be scaffolded using tubes 6 ft. long throughout.

The problem of fixing a circular platform on a square scaffold is solved by arranging for as many planks as possible to run completely



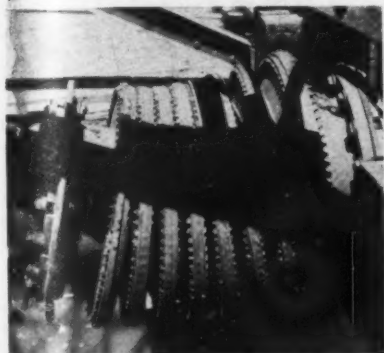
## HINTS AND HELPS

from side to side, the remaining two segments being completed with planks supported on tubular bearers attached to the main horizontals instead of to the vertical members. Thin wire lashings (scaffold ties) are used to secure the planks to the tubes to prevent them from tipping when the unsupported ends become loaded. A tubular scaffold need not necessarily be square, however, where the diameter is suitable a structure having six or more uprights may be preferable.

For demolition work, scaffold tubes and fittings may be used to construct a platform frame for suspension by one of the methods previously outlined, the planks being secured to it by wire lashings.

### Accordion Joint

TO FORM a flexible connection for the suction pipe on a dredge, the St. Louis Materials and Supply Co., at its Pacific plant, has designed and



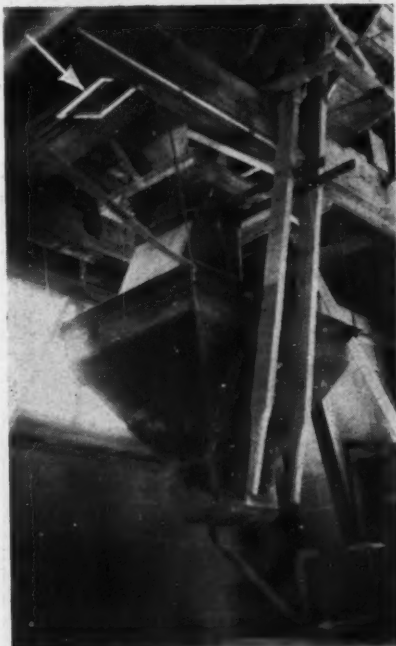
Showing how flexible joint is connected to dredge pipe

installed an "accordion joint," that permits movement of the pipe through an angle of almost 90 degrees. As shown in the sketch, the joint is shaped like the bellows of an accordion. It is constructed of 17/32-in. rubber bellow joint rings, with a 28-in. outside diameter, and a 16-in. inside diameter. The rubber is 9-ply, and is not stitched. Holding the rubber rings in place at each joint are 1 3/4-in. metal rings, held in place by nuts and bolts. The metal rings are hard-surfaced with Stooody hard-sur-

facing to prolong their life, since the aggregate forced through the pipe effects a tremendous wear on the inner surface of the joint.

### Mirrors Over Batcher

WESTPORT BUILDING MATERIAL CO., Springfield, Mo., has installed mirrors above a volumetric batcher to allow the operator to determine when the

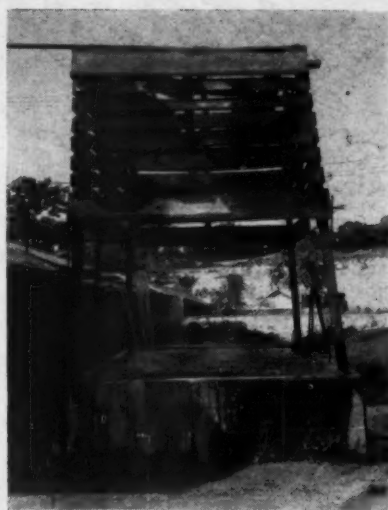


Mirrors permit operator to check which batcher hopper is full

proper amount of aggregate has been drawn from the bin above. As shown in the illustration, the mirror faces downward and at an angle so that it reveals the guide marks on the inside of the batcher. The operator, standing on a platform below the batcher, can tell by looking into the mirror when the proper amount of aggregate has been drawn into the batcher.

### Water Cooler

GARRETT CONSTRUCTION CO., Springfield, Mo., employs a series of perforated pipes and baffle plates above a concrete water-supply tank to cool water for two air compressors and a



Arrangement to supply cooled water to Diesel engine and two compressors

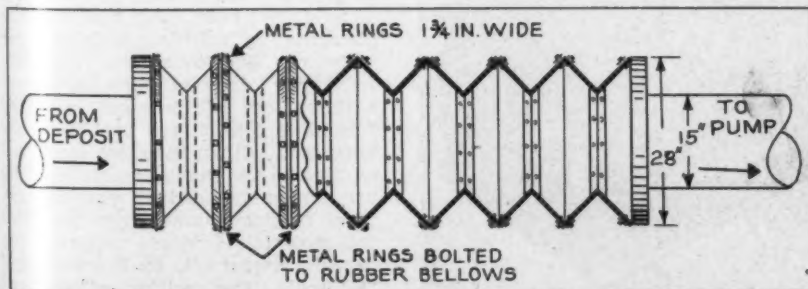
Diesel engine. The 1 1/2-in. pipe shown at the top of the accompanying illustration discharges into a 12-ft. section of perforated pipe above the tank. Above the tank and below the perforated pipe are baffle plates that divert the water downward into the tank. The water, air-cooled as it sprays into the tank, is cooled further by the addition of cold water to the tank. The cooled water is pumped back to the equipment for re-use.

### Strip Mining Oil-Sand

A CLEAN, high-silica-content sand containing but a trace of iron and having a potential use in amber-colored glass for products such as beer bottles is a by-product of a strip-mining process at oil-sand deposits at Fort McMurray, Canada. Development of these extensive surface deposits has been held back for lack of economical methods of strip-mining and separation of the sand and oil. Although several companies have been conducting research operations in an attempt to enter the competitive market none have been able to do it in quantity cheaply. One of these, the Abasand Oil Co., is planning to use mining methods similar to those followed in coal stripping, and to separate the oil from the sand by melting it off with hot water.

### Ohio Hygiene Code

FINAL notice has been given to members of the National Industrial Sand Association regarding the revisions of the Ohio Industrial Hygiene Code, to go into effect January 1, 1947. The revisions include changes in the definition of silica, allowable length of exposure to temporary concentrations, and respiratory equipment for removal of carbon monoxide from air.



Flexible accordion joint, made of rubber and metal rings, in suction pipe line on dredge

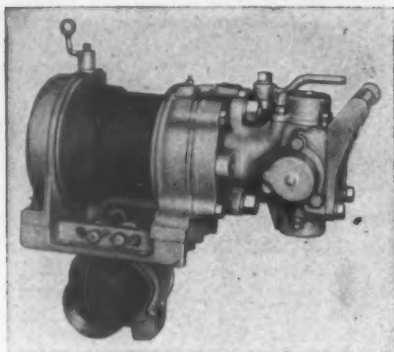




# MACHINERY

## Air-Winch

SULLIVAN DIVISION, JOY MANUFACTURING Co., Michigan City, Ind., has announced a small, lightweight, air-powered hoist, called the Air-Winch,

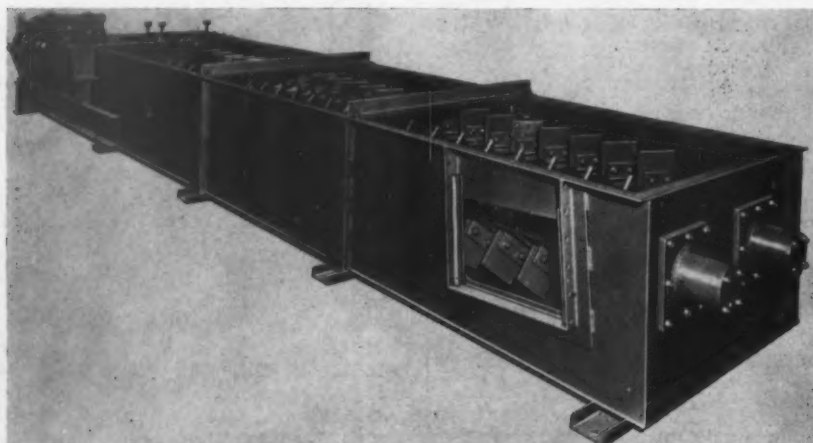


Light-weight, air-operated winch

which is capable of lifting 500 lb. It has a rope capacity of 150 ft. of  $\frac{1}{4}$ -in. rope, and it is 18 in. long, 9 $\frac{1}{2}$  in. high, and 11 in. wide. The winch is powered by a 4-cyl., reversible, piston-type air motor. As the entire winch weighs only 85 lb., it can be easily moved from place to place and quickly attached or removed. It is said to be particularly useful in mine applications.

## Improved Log Washer

ALLIS-CHALMERS MANUFACTURING Co., Milwaukee, Wis., has released information on an improved log washer. The washer has marine-type cutless rubber bearings which revolve on stationary, hardened, rust-proof stub shafts; heavy, all-welded, all-steel paddles which are attached quickly with two bolts; enclosed cut steel



Log washer equipped with rubber bearings is available in three size groups

gears; and variable log speed. The manufacturer states that it is available in three different size groups, suitable for any plant requirement.

## Carbide-Tipped Drill Bit

THE NEW ENGLAND CARBIDE TOOL Co., Cambridge, Mass., has brought out a carbide tipped drill bit which may be used to drill holes in con-



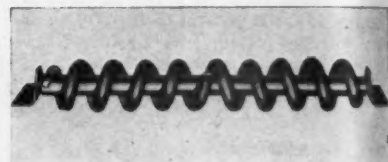
Carbide-tipped drill bit used in drilling into masonry wall

crete, brick, tile and other forms of masonry material and also metals. These drill bits are used in an ordinary rotary electric drill, and for that reason eliminate hammering. The extremely hard carbide tip is the feature of the this drill bit. Stock sizes starting at  $\frac{3}{16}$ -in. and up to and including  $1\frac{1}{2}$ -in. diameter are available.

## Rubber-Covered Return Idler

CHAIN BELT Co., Milwaukee, Wis., has announced a belt conveyor idler called the Rex roller-bearing style No. 55RC rubber-covered spiral return idler. This idler was designed to combat troubles experienced when return idlers are used where freezing and ice formation on the rolls or where high abrasive wear on the roll is a problem.

It is built of a flat-bar steel helical spiral, covered with rubber. This spiral is mounted on a standard assembly, and is permanently welded



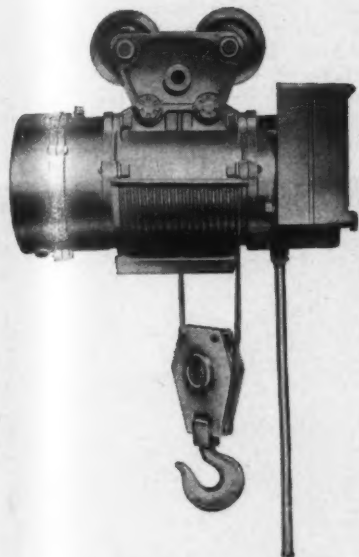
Idler is made with rubber-covered steel spiral to the bearing tube. The spiral itself is composed of right- and left-hand sections to insure centering the belt. Rubber used as the spiral covering is specially extruded and is simply opened up and snapped over the bar. The natural tension of the rubber, increased by twisting in following the spiral, holds it in place. Each end of the roll is equipped for high pressure grease lubrication, and is furnished with hydraulic type fittings. Rubber-to-rubber contact with this idler retards ice forming on the roll and also reduces to a minimum the abrasive action of materials handled on the belt.

## Self-Hardening Electrode

STOOBY Co., Whittier, Calif., has developed a coated, self-hardening, wear resistant electrode for hard-facing heavy equipment subjected to earth abrasion and impact. The electrode features an extruded flux coating, which is said to improve welding characteristics and simplify application. It is a fabricated rod consisting of mild steel tubes filled with alloying elements. In addition to high wear resistance and toughness, the self-hardening deposits can be forged without loss of hardness, provided forging is done at red heat. Deposits bond well with manganese steel, according to the manufacturer, and its use is recommended on wearing surfaces of heavy machinery made of this material. Hardness ratings of the deposits average 56 on the Rockwell "C" scale. The melting point is at 2525 deg. F., and the specific gravity is 7.8.

## Electric Cable Hoist

LISBON HOIST & CRANE CO., Lisbon, Ohio, is now introducing its Bob Cat model electric hoist. It is one of the smallest in overall dimensions of any



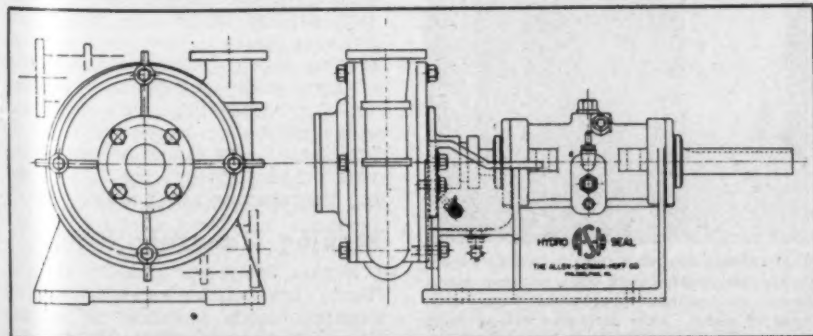
Small hoist made in three sections, permitting easy access

standard hoist, and is made entirely of steel forgings and castings plus the cable. The motor is entirely enclosed in the drum with patented heat dissipation construction.

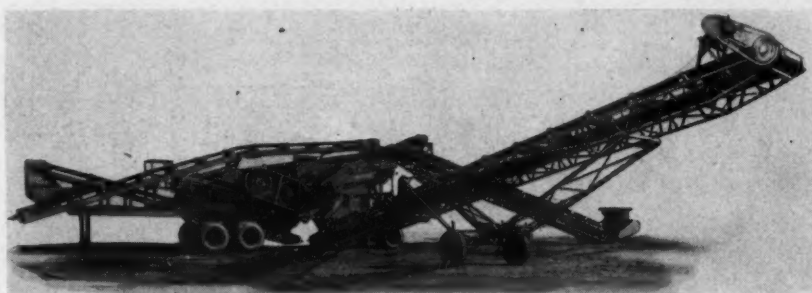
## Improved Pump for Handling Abrasive Material

ALLEN-SHERMAN-HOFF Co., Philadelphia, Penn., has announced important improvements to its line of Hydroseal pumps. The pumps now are equipped with interchangeable, heavy-duty, anti-friction radial and thrust bearings. A two-way axial adjustment of the shaft and bearing assembly also has been provided.

Instead of having the pump shell or engine side bell rigidly mounted to the pump base, both are now supported from the bearing housing. This permits pump discharge to be placed at any of three positions,



Details of improved pump for handling abrasive materials



Diesel-electric operated crushing and screening plant

simplifying installation of piping. The inside construction of the pump itself is unchanged.

## Masonry Cutting Blade

CHAMPION MANUFACTURING Co., St. Louis, Mo., has brought out a new abrasive masonry cutting blade known



Masonry cutting blade equipped with blotters for safety and steel centers for efficient operation

as the Jade blade, distinguished by its Jade color. It has been designed to increase blade life and improve cutting efficiency. The blades are available in 12-in. and 14-in. sizes to fit any type of masonry cutting saw.

## Diesel-Electric Aggregates Plant

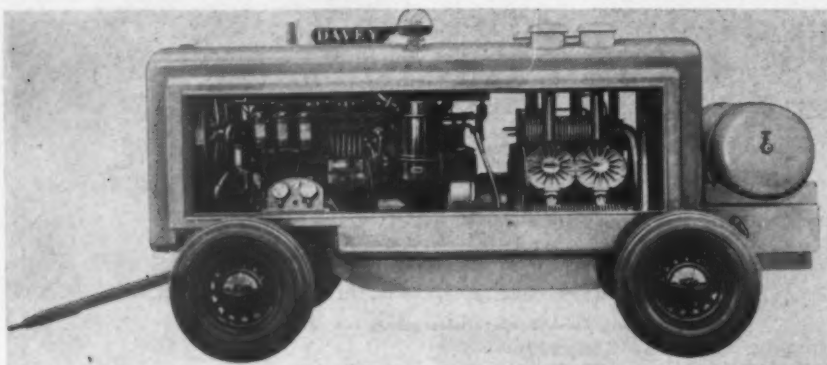
PIONEER ENGINEERING WORKS, INC., Minneapolis, Minn., has brought out a line of portable Diesel-electric powered duplex crushing and screening plants, the first of which is known as the No. 46-VE.

In this plant, the screen and conveyors are driven by electric motors from power supplied by a Diesel-electric plant. The roll crusher is driven by V-belts from the jaw crusher, which in turn is driven by flat belt to the Diesel motor. A clutch provides for starting and stopping the crusher without interrupting the Diesel drive to the generator.

Electric motor drives have permitted the elimination of snake belt drives, numerous shafts, chains and sprockets, beveled gears and pinions and swivel drives. The operating height of the plant has been lowered from 19½ ft. to approximately 14½ ft., and provision has been made for hydraulically lowering the screen so that when in transit the plant has an overall height of only 12½ ft. Moving weight has been reduced to 64,000 lb., as against 77,000 lb. for former plants of similar capacity. A low angle type, 3½ deck, 4- x 12-ft. screen is used with a 1036 jaw crusher and a 40- x 22-in. roll crusher.

## Dispersing Agent

NATIONAL OIL PRODUCTS Co., Harrison, N. J., has added a water dispersible metallic soap to its products, known as Nopco 1097, which it is claimed to be a desirable aid in compounding a better cement. According to Dr. Edwin A. Robinson, technical director of the company, the addition of this dispersing agent makes it possible to thoroughly incorporate the soap and results in an improved cement because of a more complete dispersion. The new dispersing agent consists of various metallic soaps, such as those of zinc, aluminum, calcium, lead and magnesium, blended with an emulsifier. The resulting products are, in general, water dispersible, semi-fluid, white pastes containing approximately 45 percent solids.



Compressor unit, either gasoline engine or Diesel operated, supplies 315 c.f.m. at 100 lb. pressure

### Gas or Diesel Compressor

DAVEY COMPRESSOR Co., Kent, Ohio, has announced two compressor models: 315-W gasoline-engine operated, and 315-WD, Diesel-engine operated. These machines produce 315 c.f.m. at 100 lbs. pressure, and they are available in standard skid, steel wheel trailer, and pneumatic-tired trailer mounting styles.

The compressor unit represents a radically new departure in Davey design, consisting of two banks of three cylinders, each bank being arranged in W form. It is claimed that this construction, together with a short 4-in. piston stroke, reduced compressor vibration to a minimum, and results in a cooler-operating, more efficient machine.

Gasoline-engine operated units have an over-all length of 140 in., while the Diesel-operated machines are 12 in. longer. Height is 72 in., and width 65 in. for both gasoline and Diesel machines. The gasoline-operated units weigh 7400 lb., and the Diesel-operated unit weighs 7800 lb. Gasoline engines are Hercules RXLD model, and Diesels are International UD-18.

### Test Waterproofing Agent

AQUELLA PRODUCTS, INC., Richmond Hill, N. Y., recently conducted a series of waterproofing tests at the Long Island City plant of National Brick Corporation to demonstrate to architects, engineers and contractors the effect of a hydrostatic pressure created by an 8-ft. head of water on a surface treated with Aquella.

Two test towers, made of highly porous cinder concrete block, were constructed with the absorption rate of the block predetermined as being from 22 percent to 25 percent by weight. Both columns had identical coefficients for permeability in their natural state, and were first tested in this condition.

After this test, one of the towers was treated with Aquella, while the other was not. The treated tower withstood the pressure of an 8-ft. head of water, equivalent to a hydrostatic pressure of approximately 500

lbs. per sq. ft., at the base. The untreated towers could not be filled with water higher than 18¾ in., because the water seeped through its cinder concrete block walls at the rate of 2 gal. per minute.

Officials of Aquella Products, Inc., state that this test was approximately 50 times more severe than that prescribed by the U. S. Bureau of Standards, in that tests prescribed by the Bureau call for only a maximum 2-in. head of water, or 10 lbs. per sq. ft. It is stated by the manufacturer that this waterproofing agent, meeting this rigid test, would be equally successful when applied to other types of masonry construction.



Test columns of cinder concrete block. Column to the left, treated with water proofing agent, shows no moisture penetration under 8-ft. head of water, while untreated column could not be filled with water higher than 18¾-in., due to rapid seepage

### Dustless Masonry Saw

CHAMPION MANUFACTURING Co., St. Louis, Mo., is now making a portable dustless masonry saw with a self-contained water supply system. It has been made portable by mounting saw, cutting platform, belts and motor on a stand with removable legs, similar to an ironing board, which makes it simple to pull it through windows, inside kilns, etc. The self-contained water system provides a circulating pump, belt-driven from



Masonry saw has self-contained spray system

the motor which, through a concealed nozzle, sprays a fine mist over the cutting surface, both preventing dust and cooling the circular blade.

Fatigue on the part of the operator is relieved by having the saw designed with a conveyor cart, which is pushed through with steady pressure, when the block is being cut back and forth for a light, distributed cut. Thus only one operation is necessary after the saw is set and running. The blade is completely enclosed in a metal housing.

### Heavy-Media Separation

AMERICAN CYANAMID Co., New York, N. Y., has issued a 48-page booklet describing the heavy-media separation process under the title, "Ore Dressing Notes." Flowsheets and operating data covering the application of heavy-media separation to a number of minerals make this a very valuable contribution to the literature on this subject. Of direct interest to the rock products field is the data covering fluorspar and magnesite.

### Making Concrete Brick

SPARTA BRICK AND TILE Co., Sparta, Tenn., has started manufacture of concrete brick and tile in various colors. Production will be 12,000 brick per day.



## Two-Way Conveyor Belt

GOODYEAR TIRE & RUBBER CO., Akron, Ohio, has announced the design of a two-way conveyor belt system by C. F. Smith of the belt engineering sales department. The belts are installed in a manner that permits each belt to carry material on the "return run," thus continually utilizing the top cover of the conveyor. At present the belt has its main application in the steel industry where ore can be hauled in and slag taken out on the "return run."

## Ball-Bearing Turntable

WHITING CORPORATION, Harvey, Ill., has introduced a rugged, simple turntable which has the weight carried on a ring of 1-in. diameter ball bearings, allowing the load to be turned



Turntable top is supported by hardened steel balls running in ball- race to permit wide distribution of load

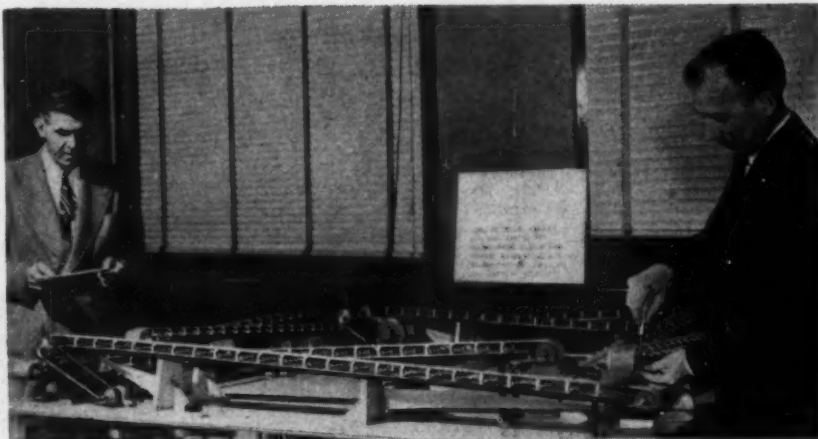
to any position with very little effort.

A quick-acting, foot-operated release lock, at table top level, holds table securely in position. The top overlaps bottom casting to prevent accumulation of dirt. Standard sizes range from 42-in. to 96-in. diameter.

## Oxygen Recorder

BAILEY METER CO., Cleveland, Ohio, has developed an automatic continuous analyzer for indicating and recording the oxygen content of a gaseous mixture. It has been applied to kilns, boiler furnaces, metallurgical furnaces, chemical and other processes. The instrument provides a graphic analysis almost instantly, and is said to be responsive to changes of .05 percent oxygen and sustained accuracy is within .25 percent.

In operation, a continuous gas sample is mixed with a vaporized liquid fuel and burned on a catalyst-filament which reaches a temperature proportional to the oxygen content. The filament resistance is a function of temperature and a simple resistance bridge is connected to a



Miniature of two-way conveyor belt system with the designer, C. F. Smith, standing to the left; P. D. Suloff of the Mechanical Goods design department is adjusting the conveyor system at a transfer point

null balance electronic recorder which may be calibrated in Excess Air, Percent Oxygen, or other desired terms. A high speed sampling system for



Oxygen recorder with concentric indicating alarm feature

handling dirty, high temperature gases is furnished with the instrument when required.

## "Shooting" Kiln Rings

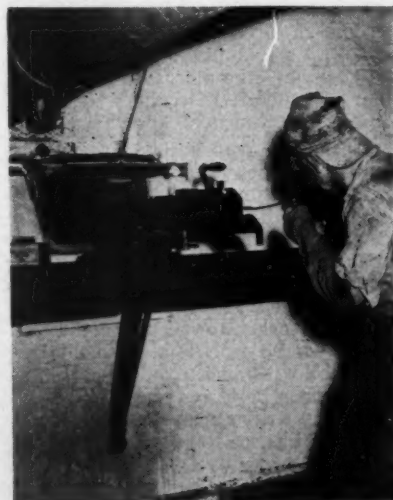
REMINGTON ARMS CO., INC., Bridgeport, Conn., has brought out an improved industrial gun for shooting down kiln rings. This method has eliminated the long delays and labor formerly involved in removing clinker rings.

The firearm is furnished with a heavy steel bracket or bolster, which may be mounted permanently on an I-beam at the firing end of the kiln. It is easily adjusted horizontally by use of a hand crank and vertically by means of a hand wheel, allowing quick and accurate aim. Only one man is required to operate the industrial gun.

The gun fires a shell of approximately 8-gauge in size and loaded with a three-ounce lead projectile which develops a muzzle velocity of more than 1600 ft. per sec., and a muzzle energy of 7475 ft. lb. The "shooter" cuts a key-way through the clinker ring with a few well-spaced shots, the kiln is then rotated, and generally the loss of the arch key causes the ring to fall. If not, a few additional shots along the junction of the ring with the kiln lining will produce the desired results.

Weighing 92 lbs., the gun is equipped with an automatic ejector, is fired by pulling a lanyard, and cannot be fired until the action is completely closed which is a desirable safety feature.

Other uses for the gun include the scaling of walls and ceilings in mines, and the removal of protruding rocks, ice and other obstructions at inaccessible points where conditions permit its use.



Mounted on I-beam ready for firing, the industrial gun may be easily adjusted to fire into any part of the clinker ring

# Quarrying



Lynn Sand and Stone Co., cuts quarry costs by the use of steel drop ball to break stone too large for primary crusher

Drop ball spotted in position by crane operator ready for release to break large stone below

## Reduce Oversize Stone with DROP BALL

By T. C. COOKE\*

**R**ARELY DOES a new machine or tool enter into the quarry business with such an enthusiastic reception as has the drop ball. This method of making little ones out of big ones probably started when man wielded impact hammers, but the machine age mechanized that process until further improvement seemed impossible. It is often said that some benefits come out of every war, and World War II has given us the drop ball. After 100 years of development in the process of breaking oversize quarry stone, we are going back to the original impact hammer, but with the help of modern machinery and advanced metallurgical knowledge.

Use of the drop ball in quarries is not strictly new, but its practicality and adaptation is. The free falling ball, released by a trigger from a regulation derrick, has been used to break up metal scrap for some years. A few small quarries toyed with this idea as much as 20 years ago with limited success. However, it could not be considered worthwhile in a large operation without the modern mobile, easily-controlled crane. The ideal crane for this use is one capable of handling a three ton load on a single hoist line on a 45-ft. radius. It can be either gasoline or Diesel powered, but should have extra long crawler

treads for stability, a high gantry to reduce boom bouncing, a boom about 60 ft. long, a live boom hoist and a free turning hoist drum wrapping only one layer of cable.



Close-up of steel drop ball, showing cable connector and method of attachment

The operator must be protected from flying stone and still have good visibility. A solid plate can be used for the purpose, but it is a hardship for the operator to keep ducking behind it at each moment of impact. The most commonly used protection device is a woven wire screen with about  $\frac{3}{8}$ -in. square openings and  $\frac{1}{8}$ -in. wire, either fastened to the under side of the boom or placed directly in front of the operator. This cannot be considered a good method because of the eye strain caused from looking through the mesh. It is necessary to have a good view of the pile of stone as it requires a great deal of dexterity to hit the target. The ball must be watched, both up and down, and the eyes unconsciously change focus between the screen and the ball. Probably the best protection is steel venetian blinds, mounted vertically, and capable of being opened and closed rapidly either manually or automatically. At least one crane manufacturer is experimenting with this device now.

The evolution of the ball itself is interesting. The free falling ball was never found satisfactory for quarry use, though the early experiments did prove a preference for a ball with the vertical axis longer than the horizontal. The spherical ball is not practical, either free or captive, because it will not stay put when it lands. In the last three years many sizes,

\*President, Lynn Sand and Stone Co., Swampscott, Mass.



shapes and hitches have been tried. The ideal size is probably around 6000 lb., but some quarries that have little oversize stone or one that fractures easily may be able to use a 4500 lb. ball.

## Shapes and Designs of Drop Ball

The first drop balls used were made of cast iron or steel, but these will not stand repeated impact due to casting strains which tend to cause breakage. The most common shape of forged ball is shaped like a pear. However, some operators do not consider the low center of gravity either necessary or desirable. There are many variations of the pear-shaped ball. One type ball has a neck about one foot high and 10 in. in diameter with the hitch made inside. Another is a true pear shape with a 2-in. slot cut 8 in. deep in the top, and a 2-in. pin driven through for the hitch. Another is a spherical sector, round on the bottom and pointed on the top. Some operators have tried using broken crusher shafts but without much success. The most satisfactory shape tried so far is a plain billet, either hexagonal or octagonal, with the vertical axis about twice the horizontal.

Considerable wear develops on the ball if it is used constantly on abrasive stone. The best compromise between toughness and brittleness has been found to be .40-.50 carbon steel. Several experiments are now being run on drop balls with renewable lower sections. If this can be done successfully, the ball can be kept at the practical weight without discarding the expensive top section which contains the hitch. There would be the added advantage of using an alloy steel in the lower section which would outwear .40 carbon. Some operators prefer a tag line on the ball, but this is certainly not essential and has several disadvantages. If a tag line is not used it is advisable to use a non-rotating hoist line so that the cable will not untwist.

The ideal size has been fairly well established and the shape is of sec-



View of drop ball, showing cable suspension

ondary importance, but success or failure depends on the hitch. Recent practice has proved that it is not practicable to put the hoist cable directly on the ball because it gets cut off by the stone too often. Either a chain, or multiple loops of old cable can be used between the ball and the hoist cable. Many have tried variations of the hitch inside a recess in the ball. This has not worked out very well because the chain or cable must be bent around a small pin and wear is excessive. A few balls have been forged with a rectangular shaped lug on the top. This is drilled for a heavy pin which attaches a very heavy shackle to the ball. The wear on the hitch is thus reduced to some extent. The most successful hitch up to the present time is a large stationary sheave welded into a slot on the top of the ball as shown in the accompanying illustrations. This method gives a larger bearing area to the hitch and it will last through two weeks of continuous operations. Fur-

ther improvement is probably possible and certainly desirable.

## Advantages

Without a doubt the drop ball is in the quarry to stay. Its use was not taken seriously until the labor shortage caused by the war forced its perfection. It can break up to 20 stones per hour ranging up to 20 or 30 tons in size. There are three major advantages over other methods of secondary quarry breakage. First, the drop ball saves labor by making it possible for one crane operator to do the work of a crew of ten men. Secondly, it contributes to accident prevention by cutting the exposure 90 percent, and removes the men from the rock pile where most of the accidents occur. It also eliminates the handling of dynamite in secondary blasting. Finally, the stone breakage is better because no oversize stone is left behind.

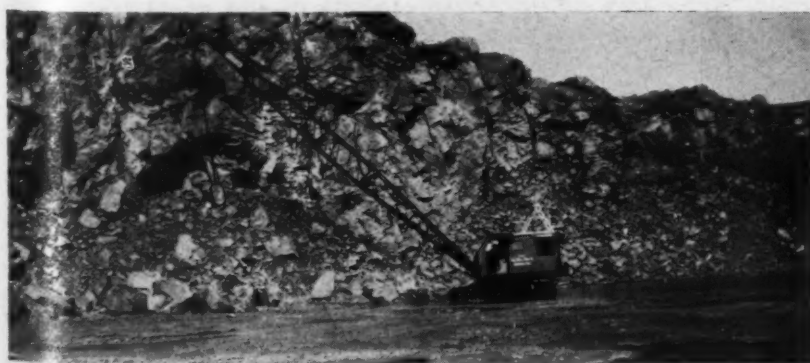
## Government Establishes New Concrete Laboratory

THE CENTRAL CONCRETE LABORATORY of the North Atlantic Division, Corps of Engineers, U. S. Army at Mount Vernon, N. Y., has been de-activated to permit the transfer of the key personnel and equipment to Clinton, Miss., where a new laboratory is to be created as a division of the U. S. Waterways Experiment Station, Vicksburg, Miss.

Known as the Concrete Research Division of the U. S. Waterways Experiment Station, it will be headed by Charles E. Wuerpel, formerly in charge of the Central Concrete Laboratory and widely known throughout the industry. The purpose of the new laboratory will be to perform all research work on cement, concrete and materials related to concrete construction which are required by the U. S. Engineer Department. A further purpose of the laboratory will be to provide adequate facilities for the investigation of problems related to concrete to be placed in specific structures by the U. S. Engineer Department throughout the United States. It is expected that the new laboratory will be ready for operations in September.

## Prevent Coal Waste

U. S. BUREAU OF MINES announces the publication of a new paper containing information designed to help prevent the waste of coal through spontaneous heating while in storage. A copy of the publication, technical paper 681, "Relative Spontaneous Heating Tendencies of Coal," by J. L. Elder, L. D. Schmidt, W. A. Steiner and J. D. Davis, may be obtained from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., for 10 cents.



Action view of drop ball falling to large stone



## TWO PLANTS IN ONE

**Campbell Limestone Co., Gaffney, S. C., large agricultural limestone producer, has two crushing and screening set-ups to meet any emergency**

By H. E. SWANSON

**Q**UARRYING from a limestone formation in a State where granite is the principal coarse aggregate, the Campbell Limestone Co., Gaffney, S. C., has been producing stone since 1936, and has the distinction of being the only limestone producer in the State. Naturally, with limestone entering the category of a relatively scarce product, this company has tapped the fertile agricultural limestone field and is concentrating about 50 percent of production in this product. Not only is agstone sold and delivered on a state-wide contract with the A.A.A., but county contracts have also been entered into for four counties in South Carolina and five counties in neighboring North Carolina.

Limestone in this deposit has a calcium carbonate equivalent of better than 90 percent, meeting the specifications of the A.A.A. satisfactorily, which call for a minimum of 88 percent. Screening and crushing operations reduce the stone to extreme fineness, as the following sieve analysis shows:

Sieve	Percent Passing
10-mesh .....	100
20-mesh .....	80
60-mesh .....	55
100-mesh .....	40
200-mesh .....	20-25

Overburden varying between 3 to 15 ft., is stripped by a 1-cu. yd. Link-Belt dragline, powered by a Waukesha gasoline motor, and is loaded to three Mack trucks which carry it to waste.

### Drilling and Blasting

Cleveland jackhammers are used to drill holes in the 60-ft. face, which is quarried in three 20-ft. benches.



H. T. Dill, superintendent

Holes, spaced at 4 ft. centers with a 4-ft. burden, are started at 2 3/8-in. and finish at 2 in., and are loaded with 30 and 40 percent Trojan dynamite. Each hole is loaded with 10 to



Showing three separate screening units over steel bins. Note how bins in background are mounted over reinforced concrete piers and floor with sufficient headroom for trucks



Conveyor in foreground moves primary crusher product to surge pile; in center is return to secondary crusher; and in the background is the conveyor to the upper plant

12 2-lb. sticks, which results in good breakage, although some secondary shooting is necessary. From 12 to 16 holes are shot at one time. Drilling for secondary breakage is done by a Thor jackhammer with 1-in. steel and forged bits. Air for the jackhammers is provided by an XB and an XCB Ingersoll-Rand air compressor.

Stone is loaded by a 1 1/4-cu. yd. No. 75 Lorain shovel into three 7 1/2-ton, chain-drive, Mack trucks, which move the stone to the primary crusher. In the event of a breakdown of trucks or the shovel, stone can be loaded manually to 2 1/2-ton skips, which are moved to the primary crusher by three Dempster Dumpsters. This method of haulage can also be used to augment the truck

haulage, since the quarry contains two conveying systems, which will be described later in this article.

### Crushing Operations

At present, stone is dumped into a No. 8 McCully gyratory crusher for primary crushing. Discharge is to a 24-in. belt conveyor, 165-ft. centers, which moves the stone to a surge pile, assuring plant production in the event of stoppage of the flow in the quarry. Under the surge pile, an 18-in. x 3-ft. vibrating feeder governs the flow of material to a 20-in. belt conveyor, 235-ft. centers, for movement to a No. 4A Allis-Chalmers hammermill. The hammermill product goes to a 24-in. horizontal belt conveyor, 12-ft. centers, which feeds the main belt to the final screening and crushing operations at the plant above the quarry floor. This is a 20-in. belt conveyor, 365-ft. centers. The primary screening and crushing system in the quarry is the operation generally used, and was installed after the other system which will now be described.

The first method of screening, crushing and conveying, still maintained as a standby and used to augment normal production when desired, consists of a primary 24- x 36-in. Worthington jaw crusher which sends stone to a 24-in. belt conveyor, 100-ft. centers, for movement to a No. 6 Allis-Chalmers gyratory crusher for secondary crushing. The product is then fed to the long belt which moves material to the upper plant. Both secondary crushers are located side by side, with the short 12-ft. conveyor, mentioned previously, being employed to move stone from the secondary crusher in the first system to the main belt which is fed directly from the secondary crusher in the second system.

### Upper Plant

Stone carried by the long, inclined conveyor to the upper plant is discharged over a 4- x 12-ft. Stephens-Adamson, single-deck, vibrating, scalping screen with 1 1/4-in. square openings. Oversize drops to a No. 7 Allis-Chalmers gyratory crusher, and the throughs go to a 20-in. belt con-



Hammermill for secondary crushing located on the quarry floor

veyor, 40 ft. centers, for transfer to a 20-in. belt conveyor, 225-ft. centers, which also receives the product from the gyratory crusher. This belt moves stone to a 5- x 14-ft. Allis-Chalmers double-deck Ripl-Flo vibrating screen with 3/8-in. square openings on the upper deck and 10-mesh screen cloth on the lower deck. The screen is located above a single, circular bin which receives the product passing the lower deck, and is stored as agstone. Altogether there are eight bins, which are unusual in that they were made from old water tanks. They will be discussed in more detail later in this article.

Oversize from the two decks goes to a 20-in. belt conveyor, 235-ft. centers, for conveying to a 4- x 12-ft. Allis-Chalmers Low-Head triple-deck vibrating screen located above a set of storage bins. The upper deck has 8 ft. of screen with 1/4-in. square openings and 4 ft. with 1/2-in. square openings, and the lower decks have 1/2-in. square openings and 9 1/2-mesh screen cloth, respectively. The stone is washed at this screen, water being received from a concrete reservoir, 8 ft. deep, 14 ft. wide, and 25 ft. long. Considerable seepage water accumulating in the quarry is pumped into the reservoir by a 4-in. Inger-

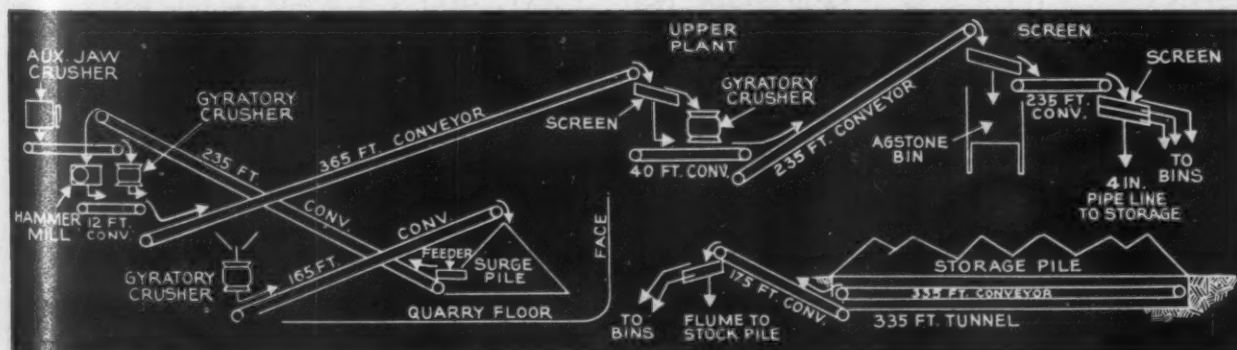
soll-Rand direct-drive pump at 325 g.p.m. against a 90-ft. head. Water is pumped from the reservoir to the screens by a 3-in. Allis-Chalmers pump at 350 g.p.m. against a 50-ft. head, and is sent through a 3-in. pipe reducing to six 1 1/2-in. pipes over the screens. Each pipe is equipped with six 1/4-in. spray nozzles to thoroughly wash the material.

The product retained on the three decks of the screen are chuted to three bins as sized stone, while the material passing the lower deck is sent with the water through a 4-in. pipe to a stockpile. The water drains away and the residue is reclaimed as agstone.

Stone in the bins is loaded to trucks through manually controlled bottom-discharge gates and is placed in stockpiles. A ramp to the top of each stockpile is maintained by a D-7 Allis-Chalmers tractor with a Baker bulldozer attachment. A 7 1/2-ton Mack truck is used to haul material from the bins to the stockpiles.

Stockpiles are located above a 6- x 7- x 335-ft. concrete recovery tunnel housing a 20-in. belt conveyor, 335-ft. centers. There are 12-in. round openings in the tunnel, spaced at 10 ft. centers, with manually-oper-

(Continued on page 61)



Flowsheet of crushing and screening operations incorporating two distinct operations in one plant

# Fine Grinding

## Belgian Experiments

### in CLINKER GRINDING

Cement company in Belgium makes interesting tests of various ball charges with different types and sizes of grinding media

CLINKER GRINDING experiments recorded herewith were outlined and started in 1931. After 22 years directing the largest Belgian cement plant, the results have now been written up for the benefit of those capable of applying them. The experiments were carried out in the plant of the *Societe Cimenteries et Briquettes Reunies* and the cooperation of Julien Lecluyse, head of their laboratory, is acknowledged.

The following conclusions of Geoffrey Martin (J. Soc. Chem. Ind. in the early 20's) have apparently been confirmed:

1. With a charge filling from 30 to 40 percent of the mill volume it is possible to double the yield by selection of the proper size of grinding

By J. A. SLEGTEN\*

media and by selection of the most suitable ratio of media weight to feed weight.

2. When the fineness is expressed as residue on the 200-mesh screen, no accurate idea is obtained as to the amount of work done.

3. Most efficient grinding speed is obtained by dividing 58 by the square root of the internal diameter of the mill in feet. All of these experiments were carried out according to this formula.

4. At these speeds the size of the mill has no effect on the result.

5. Best yields of finished cement are obtained with 20 mm. balls, followed by 25 mm. balls and then cylpebs. Silica pebbles and holpebs were less efficient.

6. The surface of the grinding media should range between 1 and 5 percent of that of the cement being ground. When the new surface is increased five times, smaller media should be used.

The experiments recorded here should give information from which the length of each compartment can be computed and from which proper sizes of grinding media can be selected.

On emptying the coarse grinding compartment of a mill it was found that the ratio of media to clinker by weight was 3.9 to 1, but nearly unity by absolute volume. As the cement is ground finer this ratio approaches still closer to unity (due to better packing). In all the experiments such a ratio was maintained and all clinker was ground with four percent gypsum. Periodically samples were taken out for sieve analysis.

\*Translated from French and abstracted by Dr. P. O. Anderegg, contributing editor to ROCK PRODUCTS.

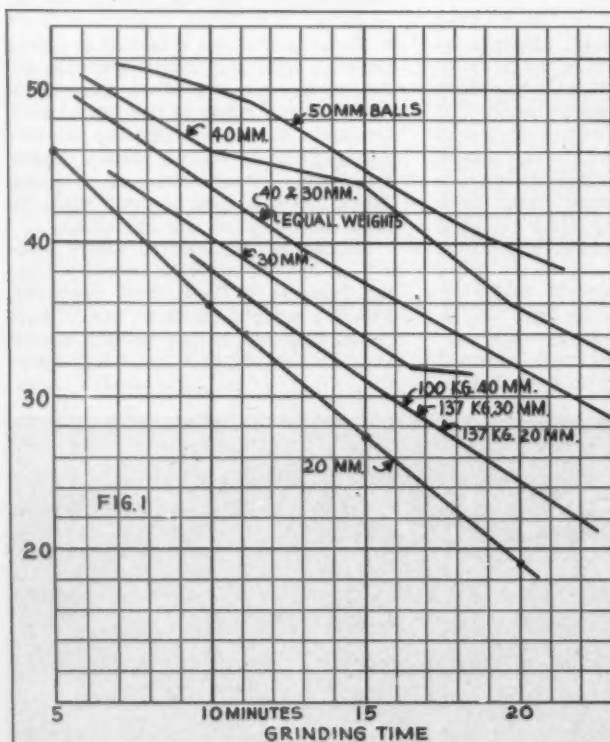


Fig. 1: Time required by balls of different sizes to grind cement from 60 to 20 percent residue on a 178-mesh sieve

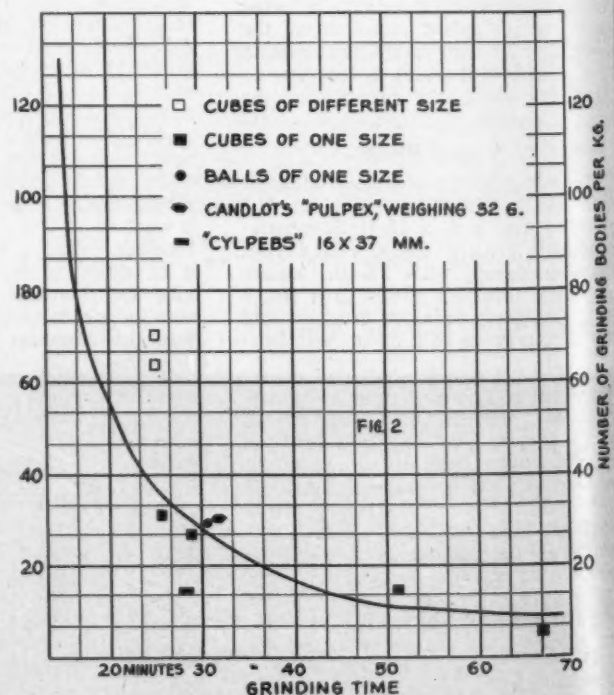


Fig. 2: Time required by grinding media of different sizes to grind cement from 20 to 2 percent residue on a 178-mesh sieve



### Coarse Grinding

A series of experiments has been made with clinker passing a 1½-in. screen. Using different sizes of balls and also mixed sizes it was found that balls below 60 mm. or above 100 mm. were not too effective. It was found that an average size of 80 mm. gave best results, but it was perfectly feasible to purchase 100 mm. (4 in.) balls and then allow them to pass on into the next compartment when they were worn down to 70 mm. Different sizes were thus always present in the mill, which seemed to work quite well.

Similar results were obtained with the same clinker but lacking the material passing a ¾-in. screen. However, balls of 40 to 50 mm. diameter seemed to produce most rapid initial reduction in clinker size, while better grinding seemed to occur with smaller balls when the clinker was ground for a longer period of time. Practically, a mixture of sizes ranging from 30 to 60 mm. did a pretty good job.

### Intermediate Compartment Experiments

For the laboratory studies 1000 kg. of clinker passing the ¾-in. screen was ground in 11 batches, each lasting 22 min. Each charge consisted of 187 kg. 60 mm. balls, 187 kg. of 30 mm. balls, 96 kg. minus ¾ in. clinker and 4 kg. gypsum. The residue from these grindings varied from 60.2 to 61.6 percent, a good reproducibility. This material was used to feed the intermediate compartment of a three-compartment mill, using various sizes and combinations of sizes of balls. Typical results are given in Fig. 1. The 20 mm. balls did more useful work in 20 min. than either the 40 or 50 mm. balls did in 48 min.

### Finish Grinding

In the third compartment, the grinding mechanism is apparently due to attrition and internal friction. With cylpebs and cylinders the tendency in this compartment is to develop faces thereon, so that the use of forged steel cubes was suggested. For this series a supply of cement ground to a residue close to 20 percent on the 178-mesh sieve was prepared. For each run the charge consisted of 210 kg. cubes (or mixed with other shapes) and 47.5 kg. cement. It was desired to grind until a residue of two percent was obtained in this stage.

It was found that cubes with smooth surfaces were more effective than where the surfaces were rough. Combining different sizes of cubes, or mixing cylinders with cubes produced little if any improvement. In one run 20 mm. balls were used, of which 30 made a kg. and the grinding efficiency was the same as for a mixture of equal weights of 30, 20 and 10 mm. cubes, of which 50 were required to make a kg. For similar shapes, the

smaller the dimension and the greater the specific surface the more effective the finish grinding as shown in Fig. 2. No runs were made, however, with still smaller sizes so that the optimum size is not known.

### Finish Grinding in Two Compartment Mill

For this experiment the cement was first ground to 50 percent residue on the 178-mesh sieve by grinding eleven batches, each containing 96 kg. clinker passing a ¾-in. screen and 4 kg. gypsum with 187 kg. of 60 mm. balls and the same weight of 30 mm. balls. The resulting residue was close to 50 percent on the 178-mesh sieve. Again in this series best results were obtained with 10 mm. cubes, the smallest used.

### Speed of Rotation and Grinding Efficiency

In all of the experiments so far reported the revolutions per minute were maintained according to the formula:

$$58$$

$$\text{r.p.m.} = \sqrt{\text{mill diameter in ft.}}$$

In one experiment dropping the r.p.m. from 39 to 25 reduced the yield by 45 percent; again increasing it to 44 r.p.m. again lowered the useful work by 14 percent.

Based on many years' experience, the wear has been found to be 235 g. per 1000 kg. cement ground, of which the loss in the coarse grinding was about 100 g.

### Summary

1. To handle clinker up to 4-in., balls with 80 mm. minimum diameter should be used.
2. For clinker up to ¾ in., use of a mixture of balls ranging between 30 and 60 mm. gives best yield of cement having 60 percent residue on the 178-mesh sieve. If it is desired to reach 50 percent residue, the balls should average a little smaller.
3. To grind from 60 down to 20 percent residue, 20 mm. balls give best results, but a mixture of sizes of about the same specific surface works as well.
4. In finish grinding to 2 percent residue, 10 mm. cubes are preferred. These weigh 7 to 8 g. apiece and it requires about 160 to make one lb.
5. The most effective rotation speed in r.p.m. is obtained by dividing 58 by the square root of the free internal diameter in feet. In practice, however, the tendency is to work at about 85 percent of this figure, with the idea of conserving power.
6. The charge should fill 30 percent of the mill volume.
7. The shape of the grinding media is secondary, with a possible slight advantage for cylpebs; but the ratio of length to diameter should be controlled to limit the weight of each unit.

### Two Plants in One

(Continued from page 59)

ated gates which allow feed from the piles to the belt. The conveyor moves stone to a final screening and washing operation used to augment the production of agstone. Discharge is to a 20-in. inclined belt conveyor, 175-ft. centers, taking the stone to a 4- x 12-ft. Allis-Chalmers low-head double-deck vibrating screen, with ¼-in. square openings on the top deck and 8-mesh screen cloth on the lower deck. Washing water is also received at this screen from the same pump providing water for the first washing operation. This screen is equipped with four 1½-in. pipes with six ¼-in. spray nozzles in each pipe. Material retained on the two decks drops to bins and the product passing the lower deck goes with the water to the agstone stockpile previously mentioned.

The storage bins were cut to desired lengths from an old abandoned water tower made from ½- and ¼-in. steel plate. They were placed on concrete substructures for durability and to permit truck loading. At the first screening operation is a single bin with a capacity of 400 tons. The second screening operation is located above a set of four bins, each with a capacity of 180 tons, and the final set of screens is above three bins, each with a capacity of 75 tons. The bins are all of the same diameter, about 16 ft., and are of varying heights.

Average production is about 900 tons per day. Shipments are made by both rail and truck, with the truck haulage on a contract basis.

R. S. Campbell, Jr., is president and general manager of the Campbell Limestone Co.; O. D. Tatum is assistant general manager; and H. T. Dill is superintendent of the Gaffney plant. This company also operates a stone plant at Beverley, S. C., near Liberty, which has a capacity of 2500 tons daily.

### Missouri Valley Resources

Four maps showing the mineral resources of the Missouri Valley drainage basin have been compiled by the Geological Survey of the Department of the Interior. The maps are designed to show the approximate location of workable deposits of construction materials and fuels, and the location of metallic and non-metallic mineral wealth. The maps will also show the relation of various types of mineral deposits to geologic formations and structural features, the amount and distribution of recent mining activity and production, and the accessibility of deposits to processing centers.

The maps may be purchased from the Director, Geological Survey, Washington, D. C., or at some of the local Geological Survey offices.

# Conveying

## Three-Stage System Elevates Material to Bins

By HERBERT E. SWANSON



Due to restricted space, three belt conveyors move aggregates to bin in main plant. The long conveyor in foreground is the final stage to the plant. Note chute feeding conveyor

**T**O UTILIZE the low cost advantages of belt conveyor transportation even while limited by space, Keefner Concrete and Lumber Co., Des Moines, Iowa, has designed an unusual aggregates handling system for its new ready-mixed concrete plant. With available space restricted to a 128- x 277-ft. area, a single conveyor could not be used, so a three-stage transfer arrangement was installed to elevate aggregates at a rate of 250 t.p.h. to discharge into a bin, 70 ft. above ground level. Nearness to the market and the business district was the deciding factor in building the plant at this location.

Placed in operation in April, 1946, the new plant was designed to pro-

### Keefner Concrete and Lumber Company, produces both central and transit mixed concrete. Plant has many automatic features

duce central-mixed concrete as well as transit-mix concrete. Aggregates bins and cement bins are equipped with automatic tripping plates which operate electrical switches actuating a warning light circuit when the bins are full. Both bins have remote control at ground level to discharge aggregates and cement into the proper bin compartments. Equipment has been installed to heat aggregates during freezing weather, and a system of adding a plasticizing agent to the mix was also provided.

Sand, gravel, and crushed stone aggregates are received at the plant by rail or truck. Railroad cars discharge into an under-track hopper with gravity feed to the first belt conveyor (all 24-in.) in the three-stage setup. Located adjacent to the conveyor is a three-compartment hopper for accommodating discharging trucks. Each compartment has manually-controlled gates to feed the product to the same belt conveyor. This 24-in. horizontal belt conveyor (all of Barber-Greene manufacture),

46½-ft. centers, transfers the aggregates to the second conveyor for elevation to a transfer station to the third conveyor. The second belt conveyor, on 91½-ft. centers, is set at an angle of 18 deg. and the third, 192-ft. centers and 18 deg. pitch, discharges into a distributing turnhead at the top of the six-compartment Butler aggregates bin, for regulating the discharge into the individual compartments. The turnhead has a selector wheel, for remote operation at ground level. Total capacity of the aggregates bin is 300 tons.

### Proportioning

Bulk cement is discharged at a rate of from 230 to 260 bbl. per hour into a three-compartment, 650-bbl. capacity bin by a 10-in. screw conveyor, 32-ft. centers, and 78-ft. chain bucket elevator. Individual compartments are filled through a flop gate controlled by cables from ground level. These compartments also have electric switches to flash lights at ground level when full. An auxiliary cement storage 650 bbl., two-compartment bin is loaded and unloaded by the same conveyor system that loads the three-compartment bin.

While aggregates are introduced into a weigh batcher manually and are weighed by a four-beam scale, cement is delivered to the weigh batcher by a screw conveyor with automatic shutoff. Cement is drawn



Pants-leg chute directs aggregates and cement from weigh batcher either to central mixer or transit mixer trucks



## CONVEYING

from separate bins by a chain-driven selector, and a push-button control starts the motor that powers the screw conveyor. As the arm of the scale reaches a horizontal position, the motor slows its speed, thus reducing the rate of flow of cement into the batcher. When the arm is level and the correct amount of cement has entered the batcher, the motor stops automatically.

An automatic shutoff also controls the water weigh batcher. Water is received from the city supply in a 150-gal. tank with float valve. Under this tank is the batching tank, with a capacity of 125 gal., with a one-beam scale for weighing.

Aggregates, cement and water, discharged through a pants-leg chute equipped with a flopper gate, can pass either into transit mixer drums or to a 3-cu. yd. Ransome mixer for central mixing. When a plasticizing agent, pozzolith, is to be intermixed the agent also enters the chute in the same manner. The pozzolith dispensing tank is located on the operator's floor, and the two 350-gal. storage drums for the admixture are located in the warehouse at ground level. A Roth pump delivers the admixture into the dispensing tanks.

Aggregates are heated in the bins during cold weather with steam supplied to jets at 30 p.s.i. from a Murray boiler. Water is heated by a Ramona water heater.

Transit mixers are charged directly under the plant, but truck mixers, when used as agitators, are charged at the side of the plant. The fleet comprises 14 mixer trucks, of which eight are Jaegers, four Smith, and two Rex. Four have a capacity of 2 cu. yd.; six are 4¼ cu. yd.; and four are 5½ cu. yd. agitating capacity. The mixers are mounted on three Ford chassis, two Internationals, two Macks, and seven Diamond T trucks. Also available for concrete delivery is a 2-cu. yd. Maxon Dumpcrete, mounted on a Diamond T truck.

Keefner Concrete and Lumber Co. has been producing ready-mixed con-



Concrete discharges from central mixer through sleeve to transit mixers

crete since 1924 at other locations in the city. J. D. Melvin is president of the company; John J. Keefner is secretary-treasurer; Sherman Gray is superintendent; and Gilbert Jensen is plant engineer.

### Will Make Ready Mix

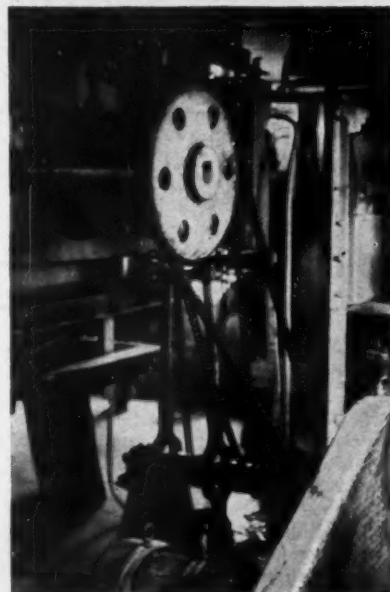
O. G. WIESNETH, Louisville, Nebr., trailer manufacturer and welder, has announced that he is going into the ready mixed concrete business, and later will make concrete culvert pipe and concrete piling.

### Dredger Adds Ready Mix

COOS BAY DREDGING Co., Coos Bay, Ore., will expand its operations with a new ready mixed concrete plant and three mixer trucks, according to Jack and William McLeod, owners.

### Adds Dryer

WING SAND Co., Hanover, Wis., has equipped its plant with a new sand dryer. This company has established its plant in a former cheese factory.



Selector drive governs flow of cement from any of the three compartments to weigh batcher



Trucks discharge aggregates to three bins located adjacent to horizontal belt conveyor. To the right may be seen second conveyor in three-stage system, and selector wheel for control of turnhead above plant bin



Discharge point from first to second conveyor in three-stage conveyor system



## Time-Saving Concrete Mix Formulae

Simple formulae determine amount of materials per cubic yard and the 28-day strengths of concrete

By A. G. LARSSON\*

**D**URING past years, St. Mary's Cement Co., Ltd., laboratory, made many tests with concrete, partly on account of our interest in the material and partly on request from others interested. Recently studies have been made of the accumulated data in these investigations, and it was found that the results obtained with regard to the amount of materials used per cubic yard and the 28-days strengths in most cases could

fine aggregates will enter and fill the spaces between the pebbles.

The various kinds of concrete tested were carefully prepared. The volumes of cement, sand, stone and water, had been measured with care. The mixing was done thoroughly by hand.

Because fine particles have the

tice, to specify the concrete by demanding that one part cement shall be mixed with stated amounts of sand and stone, it being assumed that they are measured as loose volumes. It was assumed that 94 lb. cement is equal to 1 cu. ft. Tables and formulae will be presented below, giving the amounts of cement, sand and stone per cubic yard of concrete.

It is evident that the amounts of materials required to produce one cubic yard of concrete depend on the proportions in which they are used. It has been assumed that one cubic foot of cement weighs 94 lbs., 1 Imperial gallon is equal to 0.16 cu. ft., and 1 American gallon is equal to 0.133 cu. ft., and a Canadian bag (87.5) lbs. is equal to 0.93 American bag (94 lbs.). Based on the records mentioned above the following formulae will closely estimate the amounts of cement, sand, and stone required to make one cubic yard of concrete from various mixes. Possible losses in making and placing the concrete have not been considered.

Assume:

A = 94 lb. bag.

C = 87.5 lb. bag.

w = cu. ft. water used per 1 bag cement (see Table 2)

x = cu. ft. sand used per 1 bag cement

y = cu. ft. stone used per 1 bag cement

s = cu. ft. sand used per 1 cu. yd. concrete

p = cu. ft. stone used per 1 cu. yd. concrete

The following formulae closely estimate the cement, sand, and stone required to make 1 cu. yd. concrete as recorded in Table 2.

\*Chief chemist St. Mary's Cement Co., Ltd., St. Mary's, Ontario, Canada.

TABLE 1

Sand cu. ft.	Stone cu. ft.	Volume of mixture		Weight per cu. ft. lbs.
		cu. ft.	%	
1				104.62
	1			86.50
2	3	4.06	81.38	115.2
2.1	3.6	4.52	79.24	117.57
2.5	3.2	4.57	80.16	117.79
2.7	3.0	4.61	80.90	117.51
3	4	5.61	80.22	117.51
3	4	5.6	80.00	117.83
3.1	4.5	6.05	79.67	117.51

be calculated close enough for practical purposes by the use of comparatively simple formulas. This observation is evidently of interest to the practical man. The various modes of calculations based on the aforesaid test results are described, herewith. Repeated trials have confirmed the original observations. Sand and stone were used as aggregates, the former passing sieve No. 4, and the latter between  $\frac{1}{4}$  and  $\frac{3}{4}$ -in.

From experience we know that when fine and coarse aggregates are mixed, the resulting volume is smaller than the combined volumes used. This is verified by Table 1.

It is evident that a reduction in volume must result when sand and stone are mixed, because some of the

tendency to enter and fill the voids between the larger ones, it is clear that when we mix sand with stone, there will be a reduction in the volume of the mix. This assumption is borne out by the results in Table 1. There is every reason to expect that something similar will take place in making concrete. The correctness of this assumption is of interest both from the theoretical and practical point of view.

In order to clear up this matter, a study was made of the records of concrete made with various cement and aggregate mixtures. The quantities of materials in each case had been carefully measured and recorded as loose volumes. This had been done to conform with the common prac-

TABLE 2

	Water per Bag		Material per 1 cu. yd.										Weight per 1 cu. ft. Found lbs.	Compressive Strength Found lbs./sq. in.	28 Days Calculated lbs./sq. in.
	94 lb. bags	87.5 lb. bags	Cement 94 lb. bags	87.5 lb. bags	Sand lbs.	cu. ft.	Stone lbs.	cu. ft.	Water Am. gals.	Imp. gals.					
1:1 $\frac{3}{4}$ :2 $\frac{1}{4}$	5.36	4.32	7.64	8.3	1418	13.55	1512	17.49	42.54	35.45	148	5330	5851		
1:2 $\frac{1}{2}$ :2 $\frac{1}{2}$	6.45	5.00	6.63	7.13	1568	14.98	1436	16.66	42.80	35.65	148	5062	5068		
1:2:3	6.19	4.8	6.51	7.00	1367	13.06	1675	19.37	40.30	33.58	148	5183	5056		
1:2 $\frac{1}{4}$ :3	6.45	5.8	6.26	6.73	1485	14.19	1642	18.98	40.22	33.52	150	4869	4704		
1:2 $\frac{3}{4}$ :4	7.73	6.0	4.96	5.33	1428	13.65	1716	19.83	38.38	31.98	146	3793	4065		
1:3:4	7.73	6.0	4.81	5.17	1516	14.45	1679	19.41	37.42	31.18	147	3851	3754		
1:3:5	8.51	6.6	4.29	4.61	1357	12.96	1868	21.59	36.64	30.53	146	3391	3372		
1:2 $\frac{1}{2}$ :2 $\frac{1}{2}$	6.45	5.0	6.28	6.75	1565	14.96	1443	16.60	40.40	33.62	146	5050	4858		

# CHEMIST CORNER

TABLE 3

Mix	CEMENT				SAND		STONE	
	Found	Calculated	Found	Calculated	Found	Calculated	Found	Calculated
1:1 3/4:2 1/4	7.64	7.63	8.22	8.20	13.55	13.85	17.47	17.55
1:2 1/4:2 1/2	6.63	6.64	7.13	7.14	14.98	15.26	16.66	16.95
1:2:3	6.51	6.43	7.00	6.91	13.06	13.00	19.37	19.56
1:2 1/4:3	4.93	5.17	6.73	6.63	14.19	14.04	18.98	18.72
1:2 3/4:4	4.93	5.05	5.33	5.44	13.65	13.83	19.83	20.12
1:3:4	4.81	4.63	5.17	5.22	14.45	14.62	19.41	19.50
1:3:5	4.29	4.32	4.61	4.65	12.96	13.00	21.59	21.66

Formulae used in calculating the amounts of cement, sand, and stone required per 1 cu. yd. concrete:

$$\begin{aligned} \text{No. 1 } C &= \frac{46.8}{1+w+x+y} = 87.5 \text{ lb. bag.} & \text{No. 5 } S &= \frac{39x}{1+x+y} = \text{cu. ft.} & \text{No. 6 } P &= \frac{39y}{1+x+y} = \text{cu. ft.} \\ \text{No. 2 } A &= 0.93C = 94 \text{ lb. bag.} \end{aligned}$$

$$\text{No. 1 } C = \frac{46.8}{1+w+x+y}$$

$$\text{No. 2 } A = 0.93C$$

$$\text{No. 3 } C = \frac{41.5}{1+x+y}$$

$$\text{No. 4 } A = \frac{38.6}{1+x+y}$$

$$\text{No. 5 } s = \frac{39x}{1+x+y}$$

$$\text{No. 6 } p = \frac{39y}{1+x+y}$$

Ex. 1: Assume mix = 1:2:3

$$\text{Formula No. 1 } \frac{46.8}{1+0.768+2+3} =$$

$$\text{Formula No. 2 } 0.93 \times 6.91 = 6.42 \text{ bags}$$

$$\text{Formula No. 3 } \frac{41.5}{1+2+3} = 3.91 \text{ bags}$$

$$\text{Formula No. 4 } \frac{38.6}{1+2+3} = 6.43 \text{ bags}$$

$$\text{Formula No. 5 } \frac{39 \times 2}{39 \times 3} = 13.6 \text{ cu. ft.}$$

$$\text{Formula No. 6 } \frac{6}{6} = 19.5 \text{ cu. ft.}$$

Table 2 is a summary of the amounts of cement, sand, and water required to make one cubic yard of concrete together with the weight

per cubic foot of concrete found and the water used per bag of cement.

Table 3 gives the amounts of cement, sand, and stone per cubic yard of concrete, as found and calculated by means of formulae Nos. 1, 2, 5 and 6.

Table 4 gives the cement, sand, and stone in a cubic yard of concrete as found and calculated by means of formulae Nos. 3, 4 or 2, and 5 and 6.

The above lines have described a few simple methods by means of which the quantities of cement, sand, and stone, per cubic yard of concrete were estimated. The results (see Tables 3 and 4) approached the amounts determined from the recorded measurements (see Table 2).

## Determining 28-Day Strengths

It was next attempted to find, by the use of the records, a method to design the concrete mixtures to give the required 28-days strength. In attempting to solve this problem we may look upon set concrete as a mass of aggregates cemented together by means of a hardened cement paste, similar to pieces of wood fastened together with glue. The cement paste may be called mineral glue. The paste covers the aggregate particles and fills the voids. It is evident, that the thinner the paste, i.e., the higher the per cent of water, and the lower the percentage of cement, the weaker

will be its binding power and vice versa. Prof. Abrams emphasizes this by stating that the concrete strength is a function of the number of gallons used per bag cement (about 1922). Recognition of this fact has revolutionized the design of concrete. It has moved it from the rule of thumb to the realm of science.

We must, however, admit that most of those old constructions have stood the test of time even though the cement used was much weaker than the present day product. Less water was used, at least in Europe. The comparatively dry concrete was tamped very thoroughly, as a rule, until water appeared on the surface. This required excess labor, but this was cheap in Europe. We get about the same results now by means of vibration.

It is evident that the more aggregates we use per bag of cement, the thinner will be the paste and the lower the strength of the concrete, measured by the 28-days compressive strength. The following equations Nos. 7 and 8 estimate the 28-days compressive strength in close agreement with the values found (see Table 2). The concrete used was plastic, placed in 4- x 8-in. cylindrical forms, in three layers, each rodded 25 times. The test pieces were cured under moist canvas.

(Continued on page 75)

TABLE 4

Mix	Cement per 1 cu. yd.				Sand per 1 cu. yd.		Stone per 1 cu. yd.	
	Found	Calculated	Found	Calculated	Found	Calculated	Found	Calculated
1:1 3/4:2 1/4	7.64	7.72	8.22	8.30	13.55	13.85	17.47	17.55
1:2 1/4:2 1/2	6.63	7.04	7.13	6.71	14.98	15.26	16.66	16.95
1:2:3	6.51	6.43	7.00	6.91	13.06	13.00	19.37	19.50
1:2 1/4:3	6.28	6.17	6.73	6.64	14.19	14.04	18.98	18.72
1:2 3/4:4	4.93	5.71	5.33	5.35	13.65	13.83	19.83	20.12
1:3:4	4.81	4.82	5.17	5.18	14.45	14.62	19.41	19.50
1:3:5	4.29	4.29	4.61	4.61	12.96	13.00	21.59	21.66
1:2 1/4:2 1/2	6.28	6.43	6.75	6.91	14.96	15.14	16.68	17.35

Formulae used for calculating the table are:

$$\begin{aligned} \text{No. 3 } C &= \frac{41.5}{1+x+y} & \text{No. 4 } A &= \frac{38.6}{1+x+y} & \text{No. 2 } A &= 0.93C & \text{No. 5 } S &= \frac{39x}{1+x+y} & \text{No. 6 } P &= \frac{39y}{1+x+y} \end{aligned}$$

## Can't Operate for Housing Exclusively

Leaders of sand, gravel and ready-mixed concrete industries consider problems at Chicago

**D**IRECTORS of the National Sand and Gravel Association and the National Ready-Mixed Concrete Association, meeting at the Edgewater Beach hotel, in Chicago on August 15 and 16, respectively, were practically-unanimous in believing that the Federal Government's policy of cutting off public works and highway construction to conserve materials for the veterans' housing program, would have the effect of reducing presently available supplies of sand, gravel and ready-mixed concrete.

The reason is obvious to any one familiar with these industries. The materials in demand for housing products are, of course, sand and small sizes of gravel. The coarser gravel, if not moved for public works and commercial building, must be stock piled, and facilities for stock piling at plants is usually very limited. Also, the producer can not afford to tie up all his working capital in stock piles. So, since the operator can not produce sand and small gravel exclusively for house-building needs, the curtailment of the general construction program will necessarily reduce available supplies of material for housing products. It is an excellent illustration of the havoc "planning economists," ignorant of the interrelations of industry, can make of a single, simple industry.

### Healthy Association

Most of the meeting was concerned with the routine business of the associations. Both are in excellent financial condition. The National Sand and Gravel Association has 67 active and 51 associate members. The active membership represents probably two-thirds of the tonnage of commercial sand and gravel production, but there are many small operators who should belong.

V. P. AHEARN, executive secretary, reported on convention plans for 1947, 1948 and 1949. The 1947 convention, will be the first week in March, at the Biltmore hotel, Los Angeles, Calif.; the 1948 convention, at which the first post-war exhibit of machinery and equipment will take place, will be held at the Netherland-Plaza hotel, Cincinnati, Ohio, the third week in January. The 1949 convention may be held in New York City, although that decision is not final.

The National Ready-Mixed Concrete Association has 242 member companies, which is the highest in history, and includes many of the smaller operators. Although the two associations are separate and distinct, and have different boards of directors, much the same ground, as to matters of general interest, was covered, and in this report we have combined these matters in order to save repetition.

### Association Activities

Mr. Ahearn covered the following activities of the association: Zoning regulations in various metropolitan areas are affecting sand and gravel operations. Los Angeles is an example; a large operator has been obliged to quit. Mr. Ahearn warned the industry that the time has come when it must pay more attention to house-keeping particularly in avoidance of dangerous open-pits, left unguarded. Wherever possible public criticism of operations are to be avoided. The control of stream pollution, which is a growing public demand, is a similar problem.

There have been no developments in the administration of the wage-and-hour law since Administrator Walling lost his suit against the Oklahoma crushed-stone producer. This suit was defended by counsel for the National Sand and Gravel Association, at the Association's expense. The decision of the U. S. Circuit Court of Appeals reversing the lower court's decision against the defendant, was upheld by the U. S. Supreme Court, in that it refused to review the case. However, Administrator Walling has refused thus far to reverse his ruling, and new suits may be started elsewhere. Members of the association are urged to consult with national headquarters if and when such a new suit is brought.

An unusual and new interpretation has been given in one case involving a sand and gravel dredging operator. The crew lives on board the dredge during the week and hence board and lodging are furnished by the employer. The wage-and-hour law administrator has held that wages paid for over-time (over 40 hours) must be 1½ times an hourly rate which includes an allowance for board. This of course results in a rate considerably in excess of the nominal hourly pay scale.

In cooperation with the National Crushed Stone Association and the National Slag Association, the National Sand and Gravel Association is opposing the railways in their application for changes in the rate structure which would upset present competitive relationships. The gondola car supply and the condition of the cars set out for loading were reported as about the worst on record. The Pittsburgh, Penn., area seemed to be the only one in the country properly taken care of.

### Production Booming

A canvass around the table showed that in nearly every locality production up to July 1, at least, is much above the same period in 1945 —on the average perhaps 50 percent. Probably not more than 25 percent of present output is going into housing, but practically all producers have more small orders and dealer business than ever before in history. Concrete products plants were reported cropping up everywhere.

There was no complaint of labor shortages, but some recent contracts with labor unions are not complimentary to the intelligence and intestinal fortitude of employers. Mr. Ahearn believes a tremendous amount of work remains to be done in educating employers to present their side of controversies to union negotiators. The association is in a position to be of much help to its members by informing them of current developments. Among other things, it has worked out a contract form to use with owner-drivers of motor trucks, which it is expected will prevent legal complications over social security and transportation tax issues.

### Engineering and Research

STANTON WALKER, director of engineering, reported on matters relating to research and engineering. The provisions for research at the University of Maryland will be enlarged and simplified when the new building program there is completed. Some of the studies under way there include the effects of various percentages of soft particles in the coarse aggregate in concrete (freezing and thawing resistance), a by-product of which will be data showing the relation of these results to the Los An-

(Continued on page 115)





Snapshots taken at the recent meetings in Chicago. 1—Board of directors of the National Sand and Gravel Association in session, August 15; 2—newcomer at N.R.M.C.A. directors' meeting, August 16, George C. Eady, Louisville, Ky.; 3—another new member of N.R.M.C.A. board, Norman J. Fredericks, Detroit, Mich.; 4—William Moore, Boston, Mass.; 5—Jullus J. Warner, Cincinnati, Ohio, and J. Rutledge Hill, Dallas, Texas; 6—H. B. Bellamy, Waterloo, Iowa, addresses N.S. & G.A. board; 7—F. P. Spratlan, Jr., Denver, Colo., addresses N.R.M.C.A. board; 8—H. F. G. Pelsue, New York City, and R. K. Humphries, San Francisco; 9—Stanton Walker's sons; 10—Louis C. Shilling, Miami, Fla.

## HYDRATING SYSTEMS

Various hydrators described, including pressure and vapor types, and their functions outlined in producing different products

**A** LIME PLANT operating today finds it almost a must to combine with its kiln plant certain equipment for the production of hydrated lime. Both the production of small sizes of lime in preparation processes and the demands from many sources make it impossible for the producer to avoid including it in the list of normal products that he should be able to supply to his customers.

The purpose of this article is not to discuss reasons for installing equipment for production of hydrated lime, but more to cover various possible systems by which it may be stored and packaged for shipment.

In the accompanying sketches, equipment noted is not necessarily the only type usable for the job under discussion but is used for illustration purposes only.

### Batch Type Hydrators

Fig. 1 shows perhaps the simplest form of hydrating system. In general it consists of a batch type hydrator, raw hydrate discharging directly to an automatic pulverizer fitted with cone or deflector type of separator, cyclone collector, and finished hydrated lime storage bin with packing facilities. The points one should keep in mind in consideration of this system are low productive capacity due

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By G. R. LACY\*

to batch system of hydration, dust losses through simple open vent stack, fineness limited to one grade of hydrate without extensive separator changes, and possible variation of hydrated lime quality between batches unless operator is well experienced and attentive to his job. The simplicity of the arrangement makes it one to consider for those plants where hydrate requirements are low and there is demand for only one fineness and that more than likely in the coarser ranges. It should be noted that the fan used in the air separation system is placed so as to carry the dust laden air through it. This is the older method of use which is fast being discarded today and being replaced with the fan on the return or "clean" air side of the system.

In Fig. 2 is shown an advancement over the system first described. It consists of raw lime storage fed automatically to a batch hydrator converted for continuous operation, raw hydrate storage between hydrator and automatic pulverizer, cone separator, cyclone collector and storage and packing facilities for one grade of finished hydrated lime. The vent stack is provided with a simple washing device consisting of an inverted cone over whose apex is discharged

a stream of water to create a more or less uniform curtain of water through which the dust laden exhaust from the hydrator passes, washing out a good portion of the dust and absorbing heat from the upward flowing steam to supply hot water for further use in hydration. All or part of the water of hydration can be supplied to the system through this arrangement, and as a practical point, as much should be put into the stack as is possible in order to aid in keeping the inside of the stack clean with consequent lower stack maintenance costs. The general plan has advantages over the one previously described in that the hydration is continuous, resulting in larger capacity and more uniform quality with less dust loss. The cone type separator still limits production to one fineness without considerable work in resetting it for another fineness.

### Producing Fine and Coarse Products

Further progress in the development of these hydrating systems is shown in Fig. 3. Its essential parts are the raw lime storage, continuous hydrator, raw hydrate storage bin, automatic pulverizer with whizzer separator, fan on the "clean" air side of the system, and provision for storage of two grades of finished hydrated lime. It is in the latter part

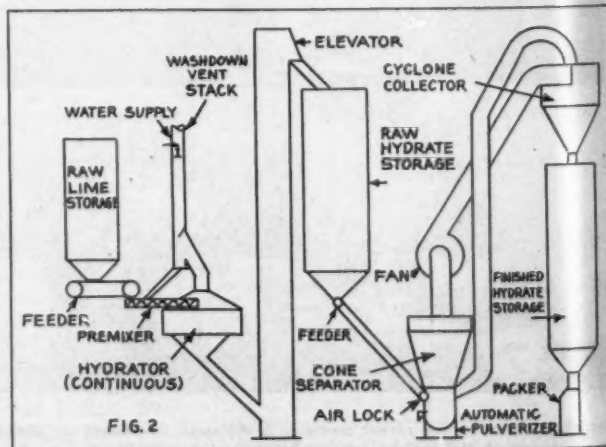
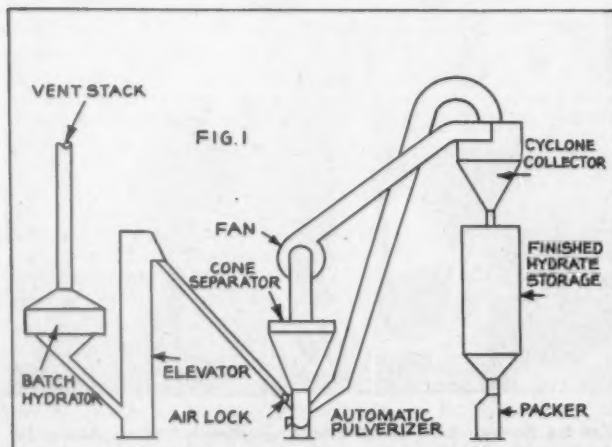


Fig. 1: Shows simple form of hydrating system, consisting of a Clyde batch hydrator, automatic pulverizer, cyclone collector, and finished hydrated lime storage bin with packing facilities. Fig. 2: A similar hydrating system but with the batch hydrator converted for continuous operation and raw hydrate storage bin between hydrator and automatic pulverizer

of the system that the greatest improvement is noted over previous plans described. The type of separator using a bladed rotor turning in a horizontal plane has turned a previously not so flexible system into a very flexible system by providing a simple and readily changeable means for varying the fineness of the final product from comparatively coarse to extremely fine. Thus, by a quick adjustment of speed of the rotating member of the separator, the plant can put out a coarse ground material suitable for agricultural use or mason's use, or a finely ground hydrated lime for use in the chemical industries and in agriculture for a spray component. Capacity of a plant of this nature is high and quality of the final product can be controlled with a comparatively narrow range.

### Dust Removal Systems

Fig. 4 shows still further refinements which make it an advance over the system of Fig. 3. These refinements include the use of a more complicated method of dust removal and inclusion of a mechanical separator in the system. Fig. 5 illustrates schematically application of two particular types of wet dust collection equipment that may be used to good advantage with a Clyde hydrator and is equally applicable to other types of hydrators. The dust removal equipment gives more nearly 100 percent complete recovery of dust that otherwise might be lost through an ordinary vent stack. In actual pounds of hydrated lime recovered, the cost of the equipment may not be quite so readily justified as it could be in elimination of a factor that could be a nuisance to neighboring properties. In fact these latter cases can be far more serious than any dust losses. For example one lime plant located near a food packing plant was forced to insure complete recovery of all dust losses in order to avoid repetition of trouble from dust falling on food cans and causing spots on them

that made the product unacceptable to the trade. The mechanical separator provides a means of scalping off a portion of the raw hydrate produced that may be of suitable size without further milling, sending the remainder through the usual automatic pulverizer, separator, and col-

### THE AUTHOR

With a background of years of practical plant experience, Gordon R. Lacy, the author of this article, presents an interesting study of lime hydrating systems. He has been associated the past year with Victor J. Azbe in his consulting service of Azbe Engineers, St. Louis.

Mr. Lacy was born August 9, 1910, at Cuba, N. Y. After graduating from the local high school, he went to Princeton University from which he graduated in 1932 with the degree of B.S. in Civil Engineering. Following graduation he worked for the National Gypsum Co., in the Clarence Center, N. Y., and York, Penn., plants in various capacities from laborer to plant manager. When he left National Gypsum in 1945, to become associated with Mr. Azbe, he was plant manager for the company at York, Penn.



G. R. Lacy

justify inclusion of the equipment in the system. We grant that this point may be well taken in that the characteristics of the material as to free moisture content, percentage of proper sized particles, and other factors can vary results obtained in different cases.

In all of these systems it should be noted that a suitable storage bin is provided for raw hydrate between the hydrator and the pulverizing equipment. Fig. 6 shows such a general arrangement incorporating a single drum preliminary hydrator with two large storage bins, each capable of handling an entire day's production from the hydrator. Following the bins there is a mechanical separator in which the rejects from the separator are carried in closed circuit with a ball mill for pulverizing. The single drum hydrator serves as more of a mixer to incorporate the water of hydration with the lime at high capacity rates, discharging into one bin or the other where the 24-hr.

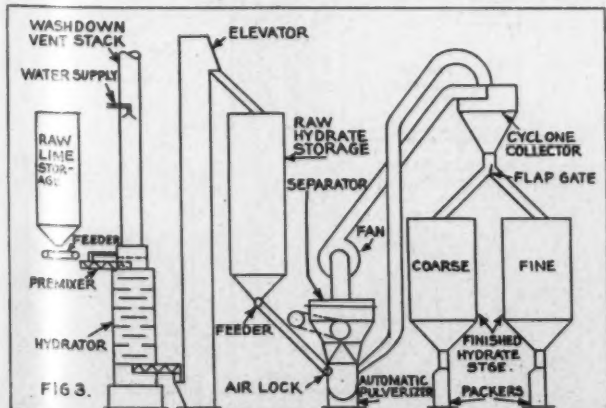


Fig. 3: Lime hydrating system which includes Schaeffer hydrator and pulverizer equipped with separator (Whizzer) to produce coarse and fine products.

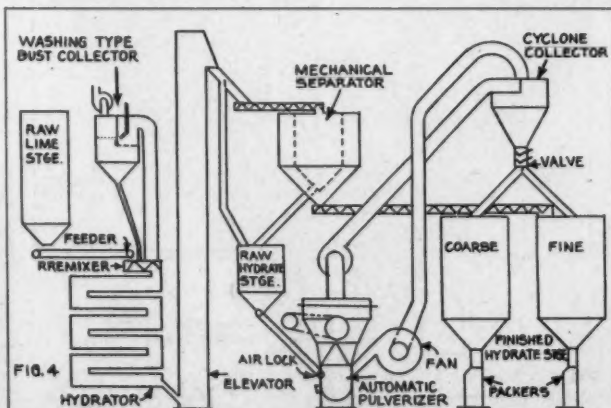


Fig. 4: Another example of a hydrating system designed to produce coarse and fine products which is equipped with a Kritzer hydrator, Whizzer separator, mechanical separator, and dust removal system



aging time provided for allows the hydration process to complete very thoroughly. A plant in Mexico City now uses such a process to produce several hundred tons of hydrated lime daily and the process is adaptable to use with any type lime; high calcium, dolomitic, or hydraulic.

The aging bin in the ordinary hydration system where hydration is considered essentially finished as the material comes from the hydrator is of great value in evening out irregularities in the product quality which may be present, resulting in wet or incompletely hydrated lime. More uniform quality is bound to result. The bin also serves to allow the hydrator to operate at the best capacity rate either for complete or preliminary hydration without having to coordinate the hydrator capacity too closely with the capacity of the pulverizing equipment following the hydrator. A still further and very important advantage is the opportunity that an aging bin gives for the continuation of hydration of the magnesia portion of the lime which normally reacts more slowly than the calcium portion.

#### Conditions for Efficient Hydration

Regardless of whether one is considering the simple or the complicated hydrating system, there are some general points of which an operator should take careful note. These include particle size of raw lime, temperature of water used for hydration, porosity of raw lime, and contamination of lime with foreign material. All have their definite effect on the final product.

Too coarse a raw lime takes longer to break down and thoroughly hydrate while too fine a lime may hold water of hydration from portions of

the mass for longer times than other portions, more than likely producing a "burned" hydrate in some portions and a wet hydrate in other parts. Cold water will not start hydration quite so quickly as hot water, and the hydrating systems having wet dust collecting systems can ordinarily produce hot water from the steam of the hydrator, heating the water in the stack as it flows down into the hydrator. A "soft" burned lime will have an open cell-like structure into which the water of hydration can penetrate quickly and easily while in a "hard" burned lime these pores are shrunk and closed up. However, this hard burned characteristic has its advantages in that while hydration may be slowed down, this slowing down results in lower temperatures in the hydrate particles and probably a generally better quality of hydrate. Contamination of raw lime with impurities means handling a larger tonnage of raw material from which to produce an equal tonnage of hydrated lime. Use of a ball mill in closed circuit with a mechanical separator can grind up what would otherwise be rejected by an automatic pulverizer provided the trade which is purchasing the product does not object to inclusion of such impurities as may thus be included.

#### Pressure and Vapor Type Hydrators

Our discussion has been limited to the more conventional atmospheric pressure paddle or blade mixing type of hydrators thus far. Also in use are the so-called "pressure" hydrators which are producing high quality hydrated lime from raw lime which when handled in the usual hydrators would not give such a high quality. Still further, the "vapor" type of

hydrator is being developed. In this piece of equipment, the hydration is accomplished by adsorption of water from a partially saturated air stream passing over the raw lime. Low temperatures within the mass result, with no chance of "burning" the hydrate as can be done in conventional hydrators with improper water contact with raw lime. At present production of a highly plastic hydrated lime is possible only from certain dolomitic limes. It is well within the range of the vapor hydrator to duplicate this job with other limes which, up to now, have not been considered practicable sources of highly plastic hydrates. This type of hydrator is also useful in treating the more active types of lime such as may be produced in rotary kilns, prior to their hydration in conventional equipment. As one might say, the vapor hydrator "deactivates" the lime where it may be more easily handled in further hydration processes, keeping undesired high hydration temperatures to a reasonable minimum. The vapor hydrator is readily adapted to any of the previously described systems.

In any of these systems, the flow sheets, or combinations of them here discussed, can be utilized to provide the lime plant operator with the results he may want. We have not gone into minor mechanical details to avoid confusing discussion of the major parts of the systems. Each plant must determine how far it may go in elaborating its hydrating equipment, keeping in mind quantity and quality of raw lime available as one factor, followed by quality and quantity of the output that will be expected. A proper balance of these two through the most suitable hydrating equipment should result in advantages to both the lime producer and the lime user.

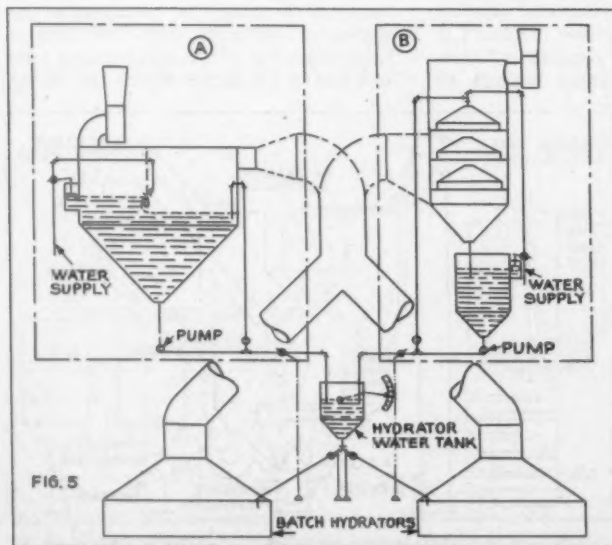
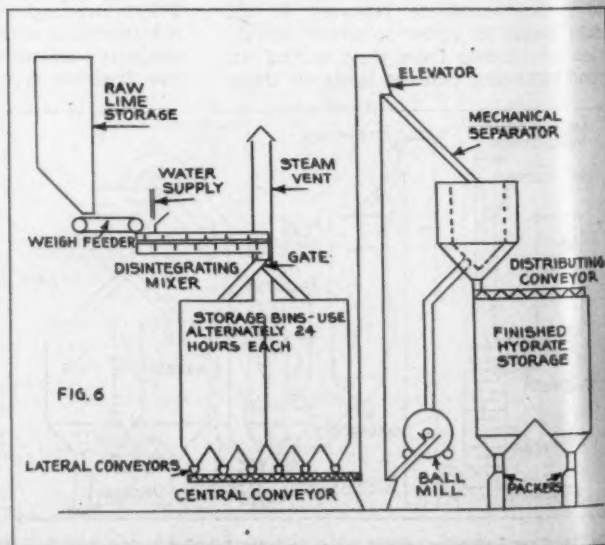


Fig. 5: Illustrating application of wet dust collection systems to hydrating plants; (A) Rotoclone, (B) Schneible. Fig. 6: Showing single-drum pre-eliminator hydrator with two large storage bins, each capable of handling an entire day's production from the hydrator



## The FLOTATION MACHINE for the Non-Metallics Industry

**Article 3: Description of various types of flotation machines and how they function; laboratory and test pilot plants determine flowsheet for economical performance**

By JAMES A. BARR, JR.

SEVERAL thousands of years ago, man may have sufficiently understood the principles of modern flotation methods to effect a separation of native gold by a pitch dipped feather, yet it remained for modern man with his prowess for extracting more durable structural metals, to construct a mechanical unit capable of standing the gaff under our present day mass production system.

There are many excellent mechanical machines which have a remarkable record for performance at an exceptionally low maintenance figure. However, relatively few froth flotation machines have played a major part in the development of non-metallic froth flotation processes as they are known today.

Flotation machines are basically the same now as they were in the late 1920s when non-metallic froth flotation started on its way to such rapid development. The major changes paralleled the developments in power transmission and the use of high strength abrasion resistant alloy

steels. Since the first flotation machine was designed there has been an unceasing struggle to determine the advantages of the mechanical and pneumatic flotation cell. Methods for introducing air into the mineral suspending medium, type and size of agitator or impeller, speed of impeller, position of impeller and the relationship of the above to the shape and volume of the cell have all been the subject of innumerable experiments.

Regardless of all the many excellent improvements which have been made in froth flotation machines, it still remains for some enterprising technologist to develop the super-performance cell which is sorely needed by those working with the elusive values associated with non-metallic industrial minerals.

Sufficient proof of this situation is found in the fact that with relatively few exceptions all laboratory flotation machines clearly give superior performance on non-metallic minerals to that attained by the large

industrial units used in the commercial mill. Although this may seem to be a strange statement to those familiar to the science of floating native metals and sulfides, it is thoroughly understood by those well versed in the art of separating non-metallic minerals by froth flotation processes.

Those froth flotation machines which have shared in the development of non-metallic minerals are the Minerals Separation<sup>1</sup> "Sub-A" (sub aeration) and recent airflow machines; the Denver<sup>2</sup> Sub-A Fahrenwald flotation machines; the American Cyanamid Fagergren and recent Steffensen<sup>3</sup> machines and the most recent International Turbo.<sup>4</sup>

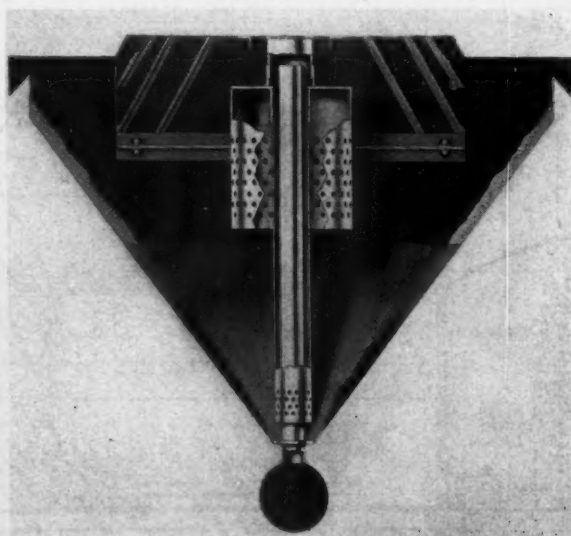
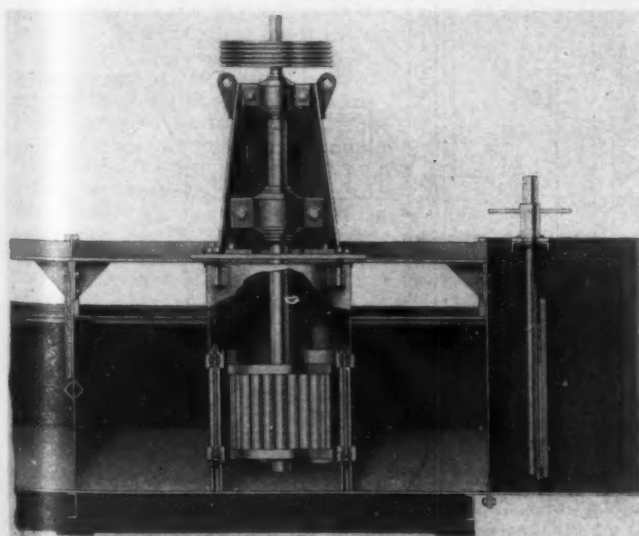
Basic functions of the flotation machine are few. Suspension of ground mineral particles by agitation and aeration of the suspending medium are the most important considerations in the design of a flotation cell. How these functions are accomplished is most clearly understood by studying the cross sectional views of each machine. Minor functions are transfer of pulp from one cell to another, removal of the min-

<sup>1</sup> Minerals Separation North American Corporation, New York City, N. Y.

<sup>2</sup> Denver Equipment Company, Denver, Colo.

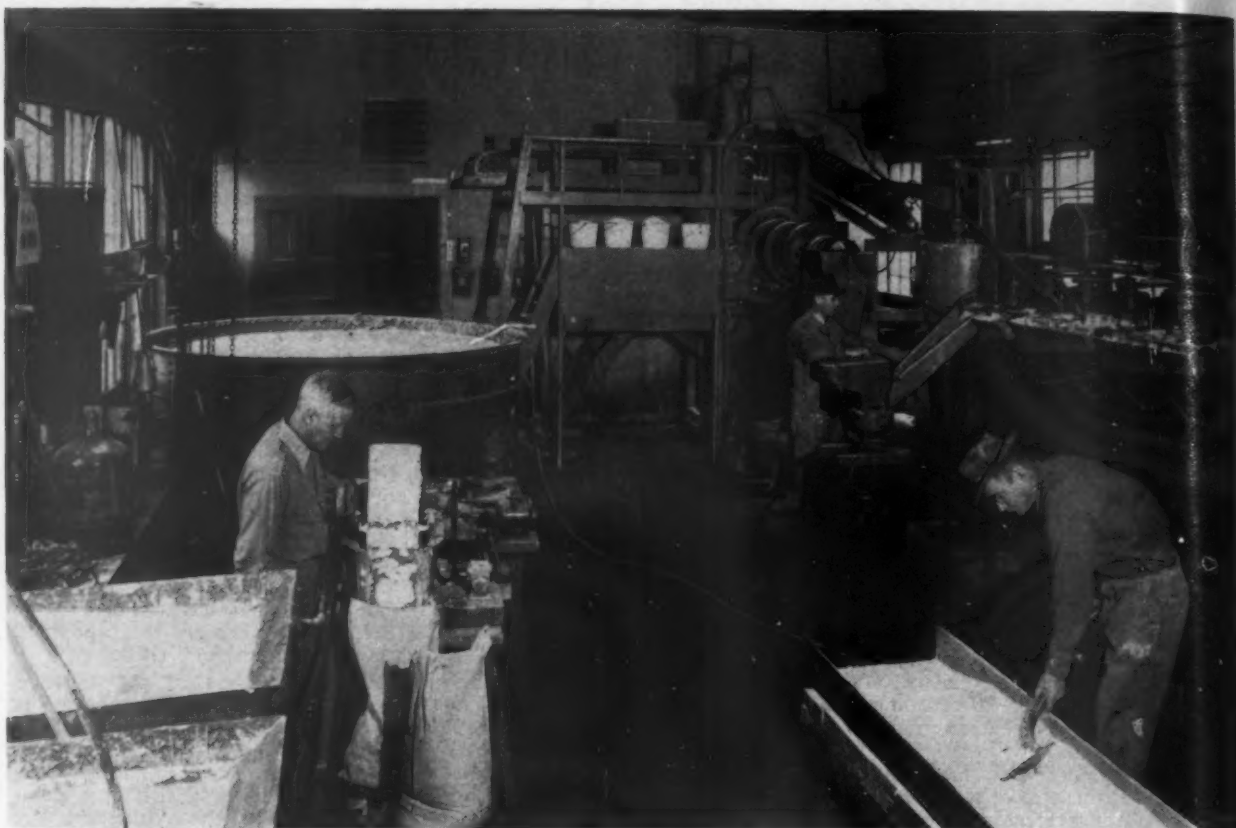
<sup>3</sup> American Cyanamid Company, New York, N. Y.

<sup>4</sup> Turbo Mixer Corporation, New York, N. Y.

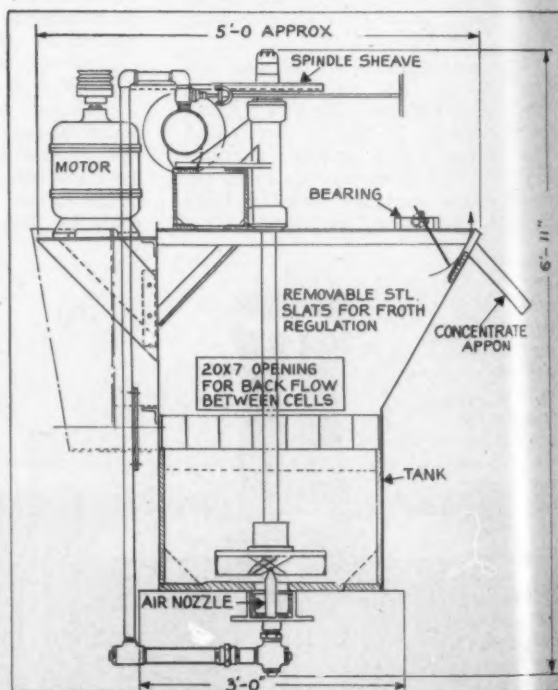
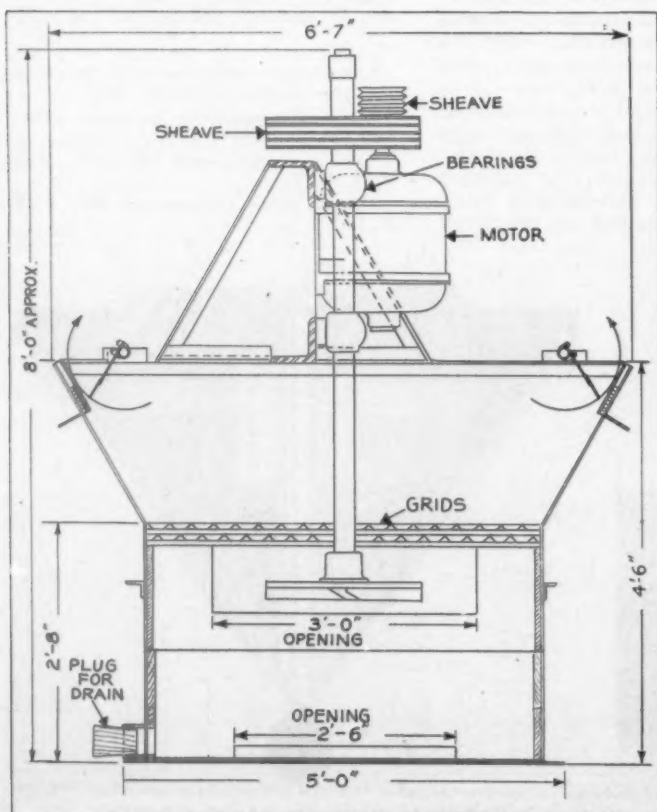


Left: Mechanical type flotation cell (Fagergren). Right: Air type flotation cell (Steffensen). Both made by American Cyanamid

# FLOTATION



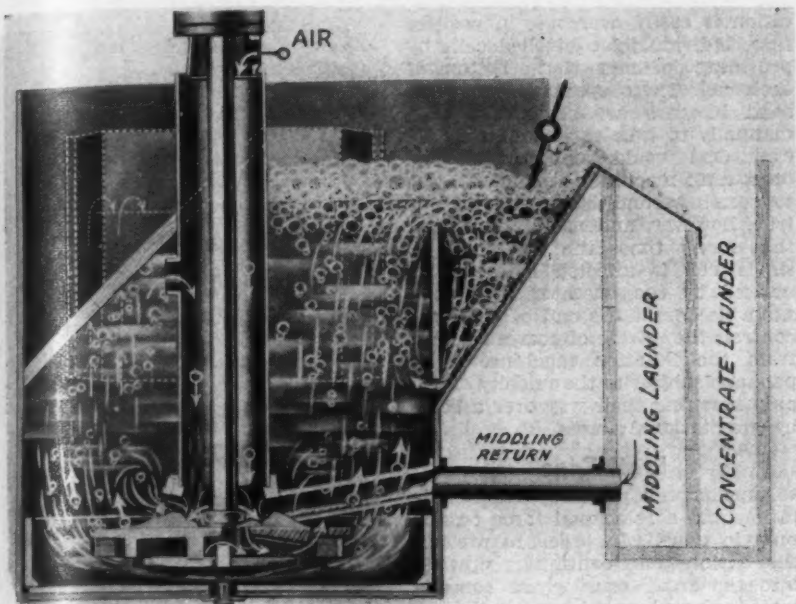
Continuous test pilot plant used in research to develop new flotation applications and processes. Battery of small Denver "Sub-A" cells, right



Above: Sub-aeration type rotation cell, Minerals Separation, North American Corporation

Left: Mechanical flotation cell operated by International Minerals & Chemical Corporation at Mulberry, Fla., plant.





Showing how Sub-A (Denver) flotation cell functions

eral laden froth and at times conditioning of mineral surfaces with primary or secondary additions of reagents.

## Agitation

Agitators on early machines quite naturally took the form of a centrifugal pump enclosed impeller. This agitator or impeller, as it is usually called, was sufficiently versatile to accomplish many things at a single location in the flotation cell. Pulp was literally pumped from one cell to the other by means of the impeller. Air introduced under pressure through the bottom of the cell by means of a small pipe nipple or self-sealing rubber nozzle which extended upward into the lower suction side of the impeller was diffused through the pulp as it was being pumped from one cell to the other. Agitation was accomplished by the pumping action of the impeller. It is needless to say that a machine of this design with the impeller operating in the zone of highest pulp density, the shaft supported by gear surfaces and guided by babbitt bearing surfaces, and power transmitted through a line shaft with a gear box at each spindle or shaft, was a power hog in every sense of the word. The howl of mechanical protest is probably still in the ears of those who worked with these early machines.

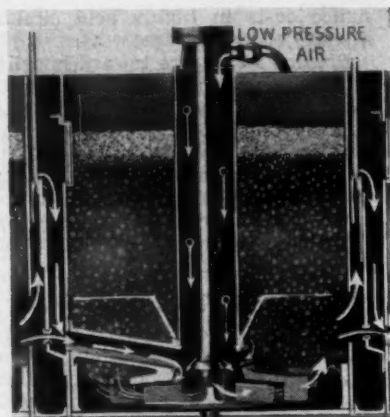
Some of the present flotation machines still have somewhat similar methods for agitation and aeration but changes in impeller design and methods for introducing air into the pulp, and use of more efficient power transmission units have changed the cell into one which has a very excellent performance record.

More recently agitation has been accomplished by vertical rotor and

stator units, as well as impeller units 18 to 24 in. above the high density zone found at the bottom of a cell. Reduction in an already low impeller maintenance and power cost are the principal claims for this innovation.

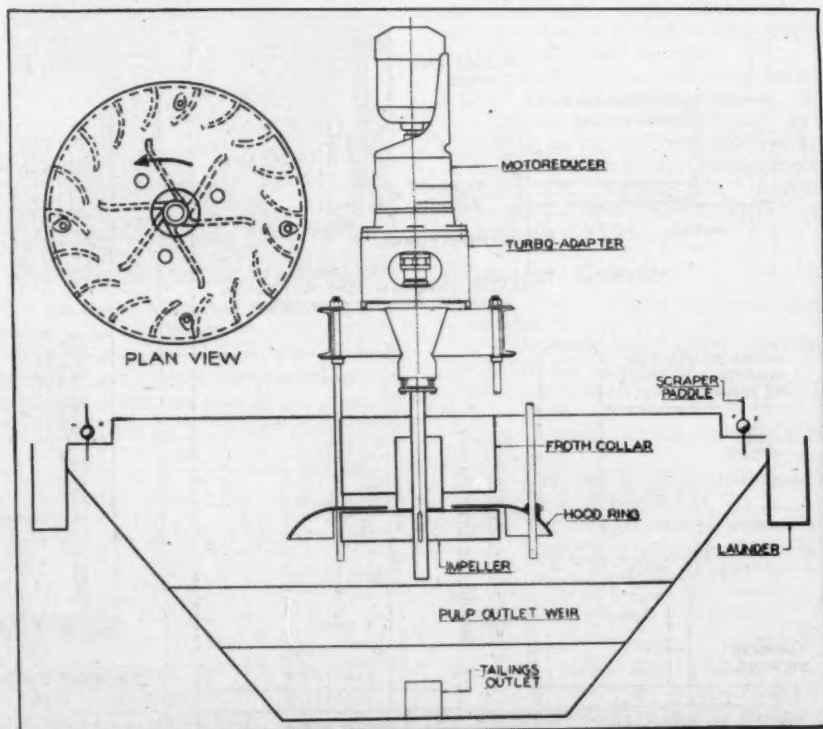
## Aeration

Air under pressure from 0.5 lbs. to 5.0 lbs. per sq. in. was forced into the impeller of the early machines by use of auxiliary air compressor



Sub-aeration flotation cell (Denver) in which supercharger principle is employed. This shows the "Low Pressure" arrangement for use in flotation of minerals where selectivity is difficult. There are also "No Air" and "Atmospheric Air" applications

units. The purpose of this air was to provide air bubbles of very small size which in turn adhered to the mineral particles previously filmed with an organic flotation reagent. Air provided in this manner constituted a decided power cost. Some of the first machines used this compressed air to both agitate and aerate the flotation pulp and some recent machines of new design to overcome the disadvantages which were inherent with the older pneumatic flotation machines are again following this method. Simplicity of design and low mainte-



International Minerals (Turbo-Floater) cell which is working very effectively in potash minerals separation, Turbo Mixer Corporation, manufacturer

nance costs in highly acid circuits are the suggested advantages.

Present trends are toward impeller units which pump their own air under atmospheric pressure. Hollow shafts, air collars extending downward to the impeller unit and even impeller units which are just below the froth zone and aerate by cavitation have served their purpose well in offering a low cost method for aerating the flotation pump with a minimum power cost.

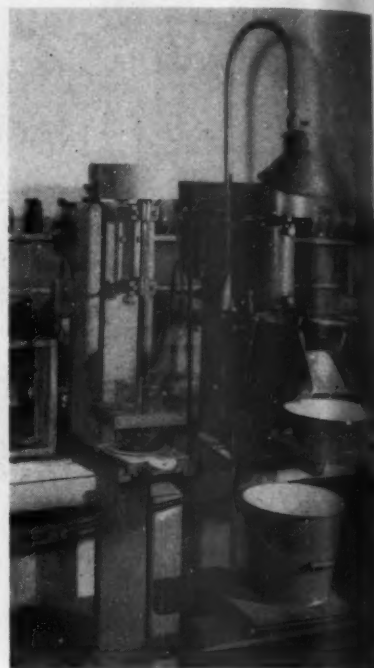
## Cell or Tank Design

The flotation cell has taken many shapes. Upon referring again to the cross sectional views one readily sees that modern cell design is quite well standardized. In spite of the fact that individual pulp level control is a very important consideration in the operation of a flotation machine, there is a trend toward designing the flotation machine as a long rectangular tank with agitator and aerator units at intervals equivalent to those used in the self-contained unit cells which when attached form the present positive flow flotation machines with individual cell control. Advantages are simplicity of construction and free flow of pulp into each agitated and aerated zone throughout the length of the flotation machine. Free flow of coarse mineral, which tends to build up a high density zone along the bottom of a flotation machine, from one cell to another or through the tank, is essential to the prevention of a condition known as sanding up. This con-

dition is easily overcome in positive flow, individually controlled cells by providing openings at the bottom of each cell. These openings known as sand bleeders are easily regulated manually to take care of any condition. One would suppose that the open tank machines are not subject to sanding conditions. This is not true, however, and usually it means that many times the volume of a single cell is affected before it is noticed by the operator. Only one sand bleeder at the end of the tank controls the release of coarse mineral from the flotation machine. Finer particles subject to the velocity of the pulp flow find their way over a baffle by gravitational forces.

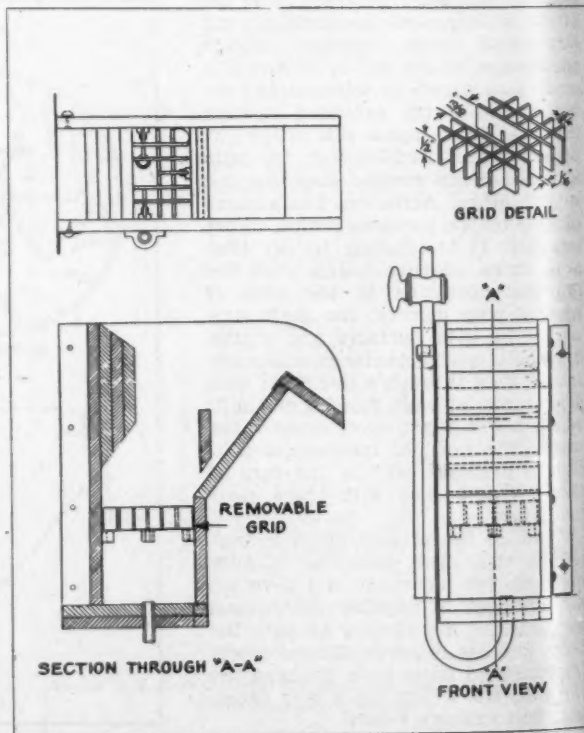
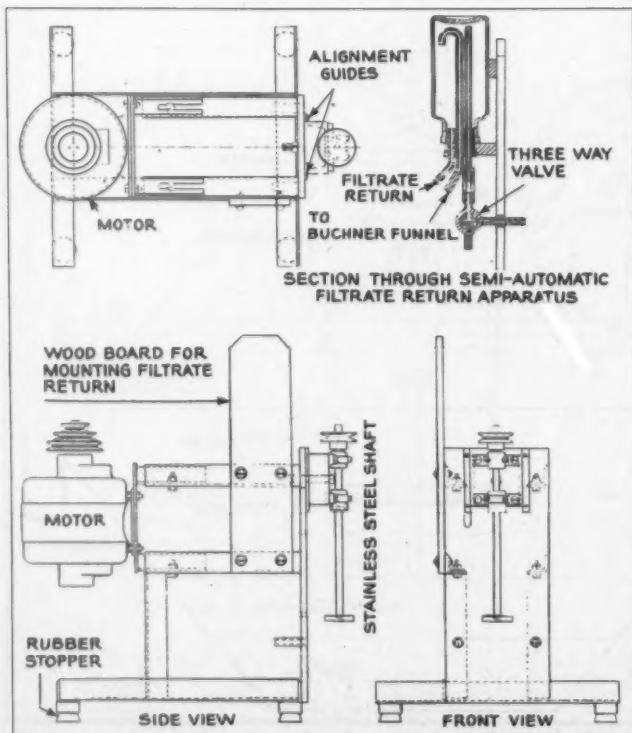
## Froth Zone

Impellers all produce violent agitation and a rotational force on the pulp in a cell. In order to prevent this action from continuing upward into the froth zone where concentrated mineral must be removed from the cell, baffles of various designs are introduced about half way up the cell or machine. These baffles usually are in the form of grids made of 4- to 6-in. strip steel welded so as to have 4- to 6-in. openings. If these grids are not used, then diffuser plates are placed around the impeller. In the froth zone there should be very little turbulence since at this point the wanted mineral has been separated from the unwanted mineral, middling particles have had a chance to return



Laboratory conditioner and Minerals Separation laboratory sub-aeration cell

with entrained unwanted gangue minerals to the separation zone. Skimmers or rotating paddles remove the mineral laden froth from the cell surface into launders which transfer the mineral and water to another

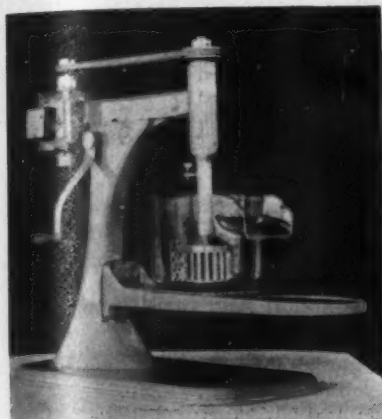


Designs of 250-gram laboratory flotation cells developed by Bureau of Mines. Left: Mechanical flotation cell. Right: Details of sub-aeration flotation cell

part of the flotation machine for re-treatment or to a finished concentrate thickener and dewatering unit.

## Power Transmission

Power units for flotation machines have all improved tremendously over the first units which required so much



Flotation cell (250 g. capacity) in laboratory

power due to mechanical inefficiency. Along with improved electrical motors, the V-belt drive was most welcome to those wishing to stop some of the noise which is synonymous with loss of power. A further advantage gained with the introduction of the V-belt drive was that a single motor could be belted to the spindles of two or even three flotation cells. Individual vertical motor drives with gear reduction units attached directly to the impeller shafts will probably be the next major change in power transmission units for flotation cells.

## Laboratory and Pilot Mill Units

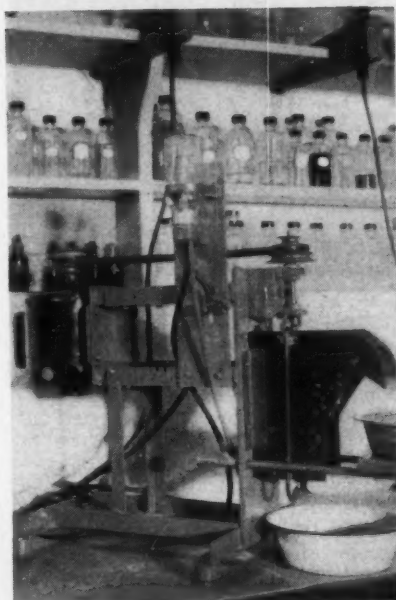
Before any large mill is built the cautious flotation engineer runs countless tests in a laboratory machine and sufficient pilot mill tests to determine the flowsheet which is essential to economical performance in a commercial mill. All large flotation mill units have their small scale counterpart which when coupled to-

gether as a continuous pilot mill offer an excellent opportunity to find out what hidden conditions may be expected in the large commercial mill. Very few men are able or would dare to attempt to translate results from a 1000-gram laboratory flotation test directly into a plant requiring a sizable capital outlay.

## Future of the Flotation Machine

The battle of size and shape of flotation machines, the battle of methods for agitation and aeration will continue.

It is doubtful that any one machine of fixed design can be used to perform all functions required of a flotation machine in various parts of a flotation circuit, however, with such a healthy condition as now exists between manufacturer and users of flotation machines, it is certain that by friendly cooperation we shall continue to see constant improvement in flotation machine design.



Laboratory mechanical flotation cell (Fagergren)

## Froth Flotation of Feldspar

A RECENT NEWS LETTER of the Ohio Ceramic Industries Association carried a paper on "Froth Flotation as Applied to Feldspar" by E. W. Koenig, general superintendent of the Consolidated Feldspar Corp., Trenton, N. J. The paper explained some of the basic principles of froth flotation and told of his company's work in that field.

Pointing out the increasing importance of methods of treating low-grade feldspar because of our dwindling reserves of high-grade deposits, Mr. Koenig tells how his company first installed a pilot plant at the Erwin, Tenn., plant. Experimentation resulted in changes in the reagents and equipment used until the final method of flotation was almost completely divorced from the original concept. A full-scale commercial plant based on their findings, was put in operation last July.

## Correction

In the first article of the series on the subject of "Froth Flotation" by James A. Barr, Jr., in the July, 1946, issue, page 99, an error occurred in the description of Coco amine reagents. The sentence starting "Coco amine reagents . . ." 14th line of the second paragraph, should read "Coco amine reagents contain 8 carbon atom (octyl) amine, 10 carbon atom (decyl) amine, 12 carbon atom (dodecyl or lauryl) amine, 14 carbon atom (tetradecyl or myristyl) amine and 16 carbon atom (hexadecyl or palmityl) amine which are all straight chain or aliphatic amines."

On page 65 of the same issue (same article), in our introduction of the author, Mr. Barr should have been identified as having been sales engineer and research and development engineer for "Kaolin, Inc.," Spruce Pine, N. C., not "Kalvin, Inc." as erroneously printed.

## Chemist Corner

(Continued from page 65)

Assume:

$s$  = 28 days compressive strength in lb./sq. in.

$vl$  = American gallons per 94 lb. bags.

$v$  = Imperial gallons per 87.5 lb. bags.

$x$  = Volumes of sand per one volume of cement.

$y$  = Volumes of stone per one volume of cement.

$$\text{No. 7} \quad s = \frac{10289}{v1} + \frac{18700}{1+x+y}$$

$$\text{No. 8} \quad s = \frac{8574}{v} + \frac{18700}{1+x+y}$$

The calculated values by means of formulae Nos. 7 and 8, are recorded in Table 2, in column marked "Calculated."

VARIATIONS IN PARTS AND EQUIPMENT BETWEEN 100, 250 AND 500 GRAM BUREAU OF MINES LABORATORY SUBAERATION CELLS

Item	100 gram cell	250 gram cell	500 gram cell
Factor to multiply inner dimensions	1	1.36	1.71
Construction material	1/4" Dilecto sheet grade xx bakelite	1.36	1.71
Stainless steel grid	1 1/8" x 1 1/8" x 1/2"	2 3/8" x 2 3/8" x 1/2"	3 3/8" x 3 3/8" x 3/8"
Openings in grid	1/4"	1/2"	5/8"
Impeller shaft	1/8" x 9 3/8"	3/8" x 14"	1/2" x 18 1/4"
Impeller blade metal thickness	1/8"	1/8"	1/8"
Vertical depth of finished impeller	3/8"	1/2"	5/8"
Impeller width	1 3/4"	2"	3"
Boston pillow blocks	PPB-8	PPB-10	PPB-12
Boston Oilite bearings	I-505-4	I-630-2	I-744-1
Motor	1/6 hp.	1/6 hp.	1/4 hp.
Height mounting plate	15"	17 1/2"	21 1/8"
Drain hole	3/8"	1/2"	5/8"



# Directors Probe Industry Problems

**National Crushed Stone Association  
and Agricultural Limestone Division  
directors hold two-day meeting**

ON JULY 18, the board of directors of the National Crushed Stone Association met at the New Yorker hotel in New York City for its mid-year session. On the following day the board of directors of its Agricul-

ment specifications for concrete pavement; (2) tests on stabilized gravel and stone road mixes; (3) tests of the relative durability of dense and open mixes, using hard and soft asphalts; (4) investigation of the

neers, the Illinois crushed stone producers, the American Society for Testing Materials, the American Railway Engineering Association, a group of Latin American engineers, and a short course at Harvard University, attended by U. S. Army engineers.



J. R. Boyd, administrative director, makes his report to the board

tural Limestone Division met. The two meetings brought together about forty members and guests. Most of the time was occupied in routine business. However, because of the tight hotel situation throughout the country, it was deemed advisable to take the preliminary steps toward selection of a convention city in 1948 and 1949. The convention in 1947 had already been fixed for the Edgewater Beach hotel in Chicago next January. The membership favors an exhibit of machinery and equipment at the 1948 convention, which, tentatively, will be held at the Netherland-Plaza hotel, Cincinnati, Ohio, in January, either preceding or following the convention of the National Sand and Gravel Association, so that the exhibit will be common to both, as in years past. The 1949 convention may be held in New York City (with no exhibit).

### Officers' Reports

After a few brief remarks by the president and chairman of the board, G. A. AUSTIN, Decatur, Ga., the engineering director, A. T. GOLDBECK, made his report, in which the following points were brought out: Laboratory research in connection with the Connecticut State Highway Depart-

effect of time of drying on specific gravity of coarse aggregate. In addition to these research subjects, numerous routine tests were carried out to determine the relative fitness of various kinds of aggregates for specific uses or applications.

The outside educational work done by Mr. Goldbeck included various papers and discussions before the American Concrete Institute, the Connecticut Society of Civil Engi-

### Technical Advisory Committee

Mr. Goldbeck also presented the minutes of the first meeting of the Technical Advisory Committee of the Association, which consists of G. A. Austin, chairman; F. O. Earnshaw, T. C. Cooke, J. E. Gray, A. T. Goldbeck, A. W. McThenia, A. B. Rodes, R. C. Sheperd, Don Williams and W. F. Wise. The committee was concerned primarily with getting producer members to make more effective use of the Association facilities, as well as to try to develop more field work for the field engineer. J. E. GRAY, secretary of the committee is the field engineer, and he made a brief report on his activities, which apparently have consisted chiefly of "trouble shooting"—that is to say competitive problems.

In his concluding remarks, Mr. Gray stated: "It is apparent that the work of the field engineer has developed into two spheres of activity: one, the making of calls on producers and engineers to find out problems and offer assistance, and the other, to go out on assignments on special problems. When construction is increasing in volume, there are usually



W. H. Wallace, Bay Port, Mich., and Russell Rarey, Columbus, Ohio

more technical problems requiring attention. In the limited time available for calls on members, it is necessary for the field engineer to concentrate his efforts on those areas where the greatest possibility exists for being of value.

## National Issues

J. R. Boyd, administrative director, reported on the construction outlook; reviewed briefly the famous Schroeder case in Oklahoma, where a crushed-stone producer was held to be under the Fair Labor Standards (wage-and-hour) Act because he furnished material for a highway used in interstate commerce. The Federal District Court decision against the producer was overruled by the Tenth District Circuit Court of Appeals, and the U. S. Supreme Court has refused to review this latter decision. The case was fought through the courts largely through the assistance of legal counsel for the National Sand and Gravel Association.

Another matter reported upon was the Association's participation with the National Sand and Gravel Association in the Interstate Commerce Commission cases Ex Parte 148 and 168 in order to oppose the railway's application for an increase of 25 percent in freight charges, and an increase of 20 cents per ton on aggregates. The hearings were to have taken place at Buffalo, N. Y., and Atlanta, Ga., on August 5.

Mr. Boyd noted some progress by Congress in restraining the bureaucratic administrative agencies of the government through the passage of the Administrative Procedure Act (Public Law 404). He was not too optimistic, but thought it was encouraging to learn that the Federal Trade Commission was the first agency to change its procedures to bring them in line with the Act.

On price control under O.P.A., Mr. Boyd was not able to be very specific because at the time the fate of this agency was hanging in the balance. However, efforts to have decontrol applied broadly to the industry had



F. O. Earnshaw, Otho M. Graves, and Henry A. Muschke

already resulted in success in the cases of rip-rap, railway ballast, furnace flux stone, refractory dolomite and stone used in the manufacture of glass, which have been removed from price control.

Membership in the Association as of July 15, consisted of 112 active members and 69 associate members.

## Association Activities

The most lively discussion concerned a proposition by W. R. SANBORN, Kankakee, Ill., to redistrict the United States so that the regional vice-presidents would represent producers with more or less similar operating conditions. At present, he said, mid-west producers are not given enough attention to keep them interested. Some of Mr. Sanborn's criticisms were rather roughly handled by Association defendants, but probably a committee will give them serious attention.

The two members of the board representing the Agricultural Limestone Division, JAMES EELLS, Cleveland, Ohio and S. P. MOORE, Cedar Rapids, Ia., reported briefly on its success. Both paid high compliments to Otho M. Graves, for his part in getting the Division organized.

J. B. TERBELL, New York City, one of the directors representing the



Mrs. F. O. Earnshaw and Mrs. H. A. Clark



James Savage and A. T. Goldbeck talk over a problem

Manufacturers' Division, praised the work of one of his co-directors, L. W. SHUGG, in his handling of exhibits for the last several years. He said the Manufacturers' Division favored an exhibit at the 1948 convention. L. W. SHUGG announced his resignation as a member of the board, since he is retiring from the General Electric Co., as noted in the personal columns of this issue, after more than 45 years of service as a manager of exhibits.

## Sons Replace Fathers

The board elected two new members to succeed their fathers, who resigned. HORACE C. KRAUSE, St. Louis, Mo., succeeds his father E. J. KRAUSE,

(Continued on page 112)



S. B. Downing, Jr., Lexington, Ky.; Otho M. Graves, and Mrs. Downing

## Operating Trends



Airplane view of Northwestern States Portland Cement Co. plant at Mason City, Iowa

# IOWA Favored by Abundant Resources of Gravel, Limestone and Gypsum

By H. E. SWANSON and NATHAN C. ROCKWOOD

Iowa has an abundance of limestone and gravel in the eastern part of the State, gravel and some limestone in the central part, and a little stream gravel in the western part. This is explained by the fact that sometime during the geologic past, the northeast corner of the State was pushed up, bringing the older rocks to the surface. At Des Moines, due to the dip of these rocks, they occur about 2000 ft. below the surface and are covered with younger rocks as well as glacial drift. In the western part of the State are younger shales and sandstones and glacial drift that does not carry much gravel.

Although all of Iowa was glaciated, only the Wisconsin drift carried much gravel. This drift, shown in an accompanying map, occurs in a tongue-shaped area terminating near Des Moines. The Iowan and Kansan drifts are made up mostly of clay, sand and boulders. The stream bed and outwash deposits of the Wisconsin drift are relatively free from clay because they have been so moved about and washed that the shale has been ground to mud and carried away.

All of the rock strata are of sedimentary origin. The geologic ages

represented are Proterozoic, Paleozoic, Mesozoic, and Cenozoic, and may conveniently be divided into two major units: indurated and unconsolidated.

The indurated rocks are quartzite, limestone, dolomites, sandstones, shales, coals, and gypsum. The Sioux quartzite, a metamorphosed sandstone, is the oldest and is of Precambrian age. The next younger rocks are of Paleozoic age and include gypsum, siltstones, dolomites, limestones, shales, and sandstones. Youngest of the indurated rocks are the Cretaceous sandstones, shales, and limestones.

The Paleozoic rocks were deposited originally in a horizontal position. Later they were depressed to form a basin, or syncline, elongated in a northeast-southwest direction. Erosion following the formation of this basin resulted in the pattern of the Paleozoic rock surface as it is now known. The oldest rocks form bands around the edge of the basin. As the axis or deepest portion of the basin is approached, younger and younger rocks are encountered. The older

rocks dip under the successively younger ones.

Although the Iowa syncline is the major geologic structure of the State, there are numerous minor structures, which, although small, have played some part in the development of mineral resources.

Cretaceous rocks were deposited on the upturned and eroded surface of the Paleozoic over a large portion of northwestern Iowa, over smaller areas in southwestern Iowa and possibly in the northern part of the State.

The unconsolidated geologic materials of the State are chiefly glacial drift, loess, and alluvium. All of these deposits were emplaced in relatively recent geologic time. There are five glacial drift sheets in Iowa, indicating that there were at least five advances of glacial ice into the State.

Glacial drift materials are at the surface over much of the State. Notable exceptions are in and adjacent to the "Driftless Area" in the northeast, along the Mississippi, Missouri, and Big Sioux rivers, along the major streams tributary to the Mississippi in the east and on the divides between



these tributaries. All of these areas were once covered by drift but later erosion has exposed the underlying bedrock. It is from the glacial drift and alluvial beds that most of the sands and gravels are obtained. The concentration of relatively pure sand and gravel bodies as they are found today was accomplished chiefly by flowing water derived from melting glacial ice and by present streams flowing over the drifts.

During the warmer periods in glacial times when the ice melted, large quantities of water as well as much of the solid material that was picked up by the moving ice, were released. The water moved fast enough to carry away the fine material but it deposited the coarser sand and gravel as an apron around the margin of the ice. In some cases the ice later advanced over this apron or outwash plain. This appears to be the explanation of the sand and gravel zone beneath the thousands of square miles in northwestern Iowa. It may also explain in part the concentration of the sand and gravel in the northern part of the State.

The sand and gravel bodies as we find them today in the river valleys were deposited during periods of high stages of flow, the clays and sands during periods of lower flow. During

the formation of present stream valleys and during relatively recent high stages of flow, river and stream terraces or "second" and "third bottoms" were formed. These are an important source of sand and gravel. Present streams and rivers flowing

over the glaciated areas erode the drift and carry away much of the finer materials, and in places deposit sand and gravel. These alluvial deposits are also a major source of sand and gravel production.

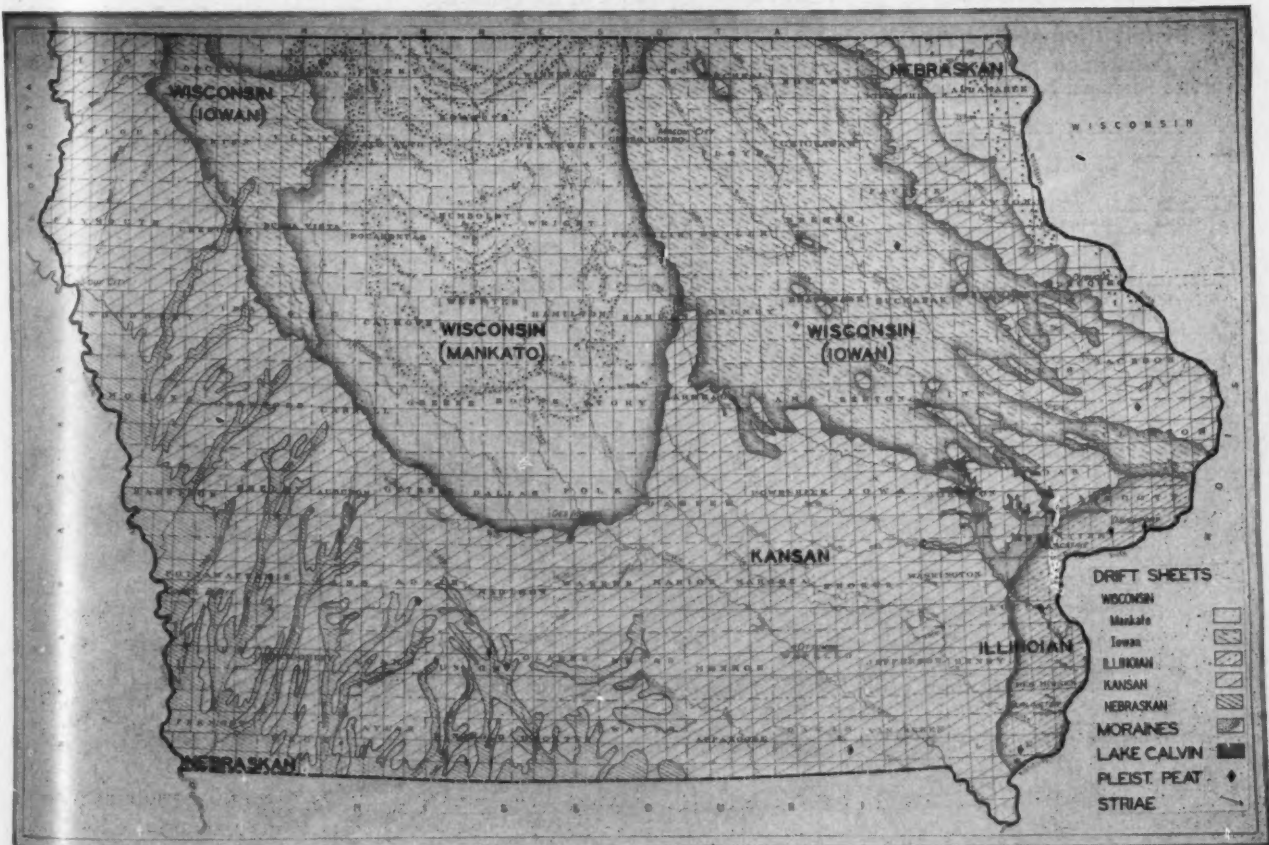
## Widespread Quarry Industry

**L**IMESTONE AND DOLOMITE are the principal types of stone produced and used in Iowa, although some sandstone is quarried. The foremost uses of limestone and dolomite are as crushed stone for concrete aggregate, road metal and railroad ballast; as agricultural ("lime") stone for soil beneficiation; and as rip rap. The most important sources of limestone and dolomite are the Galena-Platteville formations of the Ordovician system, the Gower and Hopkinton formations of the Silurian system, the Wapsipinicon, Cedar Valley and Shellrock formations of the Devonian system, the Hampton, Burlington and Keokuk of the Mississippian system and the Missouri series of the Pennsylvanian system.

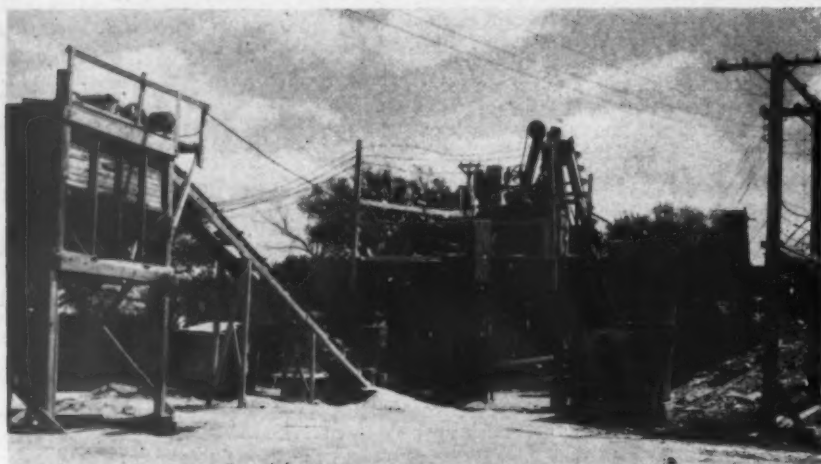
Limestones predominate over dolomites in the areas where Devonian, Mississippian and Pennsylvanian rocks crop out. Devonian production has been chiefly from limestones in

Black Hawk, Scott, Linn, Johnson and Cerro Gordo counties. Mississippian limestones have been chiefly exploited in Marshall, Van Buren, Hardin and Pocahontas counties. Chief among the counties producing Pennsylvanian limestones are Appanoose, Madison, Adair, Decatur, Fremont, Mills, Montgomery and Adams. A small quantity of limestone has been produced from the Greenhorn (Cretaceous) formation in Plymouth County in northwestern Iowa.

Dolomites predominate over limestones in areas where Cambrian, Ordovician and Silurian rocks are exposed. Cambrian dolomite is of minor importance and has not been widely exploited in Allamakee County, the only area where it is found at the surface in this State. Ordovician dolomites, on the other hand, are highly important and have been widely exploited, chiefly in Dubuque, Clayton,



Map of Iowa showing surface distribution of glacial drift sheets which determined the location of gravel deposits over the northern and central parts



Typical small crushed stone plant operated by Waterloo Dredging Co., Waterloo, Iowa, produces roadstone and agstone

Winneshiek and Fayette counties. Production of Silurian dolomites is largely from Jones, Clinton, Jackson and Delaware counties.

Sandstone utilized primarily as building material has been obtained from lower Pennsylvania sandstones in Jasper, Iowa and Hardin counties. The sandstones of the Ste. Genevieve and St. Louis formations of the Mississippian have been utilized. St. Peter sandstone has been used for glass making and other purposes.

## Distribution of Quarries

The distribution of existing stone quarries is shown herein. It indicates

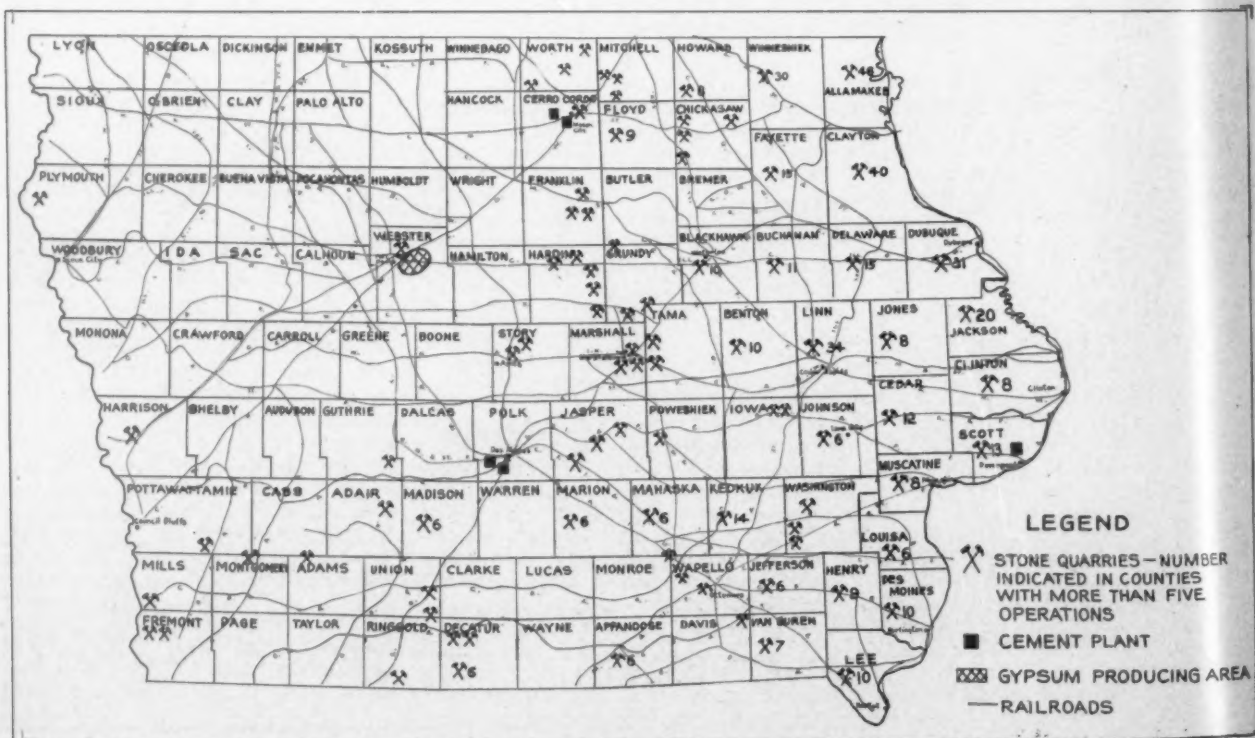
that eastern Iowa and particularly the northeastern portion of the State has been widely utilized for stone. In those areas indurated rocks are exposed at or near the surface; limestones and dolomites predominate over shales and sandstones and there is a ready market. Vast quantities still remain to be developed and are relatively easily obtainable over most of the area.

Topography plays a role of considerable importance in the exploitation of rock resources in Iowa. Generally the land surface is rolling, but in almost all areas where stone is quarried there is sufficient relief to

make high quarry faces possible. The thickness of the beds and the bedding characteristics of the rocks are also favorable in all pre-Pennsylvanian systems. The quarry in the Galena formation at Dubuque with a face of over 200 feet is the highest in the State. Many quarries are over 100 ft. high.

In south-central and southwestern Iowa, in the area occupied by the Pennsylvanian rocks, the availability of stone is somewhat more limited because shales, coals, sandstones and other "coal measure" rocks predominate over limestones. In the Missouri series of the Pennsylvanian, however, some heavy limestone beds occur which are suitable for large-scale quarrying operation. This is particularly true of the Missouri series in Madison County where large quantities of rock from the Winterset-Bethany Falls portion of the section are used not only for crushed stone but for cement making as well. Somewhat less extensive are the limestone beds in the Virgil series which are utilized in Fremont, Mills, Montgomery and Adams counties.

In northwestern and parts of southwestern Iowa, stone has not been commercially available because of the thick cover of glacial drift. Exceptions are the exposures of Greenhorn limestone and Dakota sandstone along the Big Sioux River which forms the northwestern border of the State, and a few scattered exposures farther east.



Map of Iowa showing location and number of quarries, cement plants, and gypsum areas with relation to railroads in color



## OPERATING TRENDS

The principal centers of stone production are somewhat variable from year to year. In 1943 the counties showing greatest production were Black Hawk, Scott, Jones, Dubuque, Marshall, Linn and Johnson. In 1944 the leaders in the order of rank were Black Hawk, Scott, Marshall, Linn, Dubuque, Johnson and Adair. The main reason for the shifts in production is that large volumes of crushed stone are used for road surfacing. County and State paving projects are not carried on each year at a uniform rate in every county. Therefore the annual shift in production volume generally is toward those counties which have a large road improvement program.

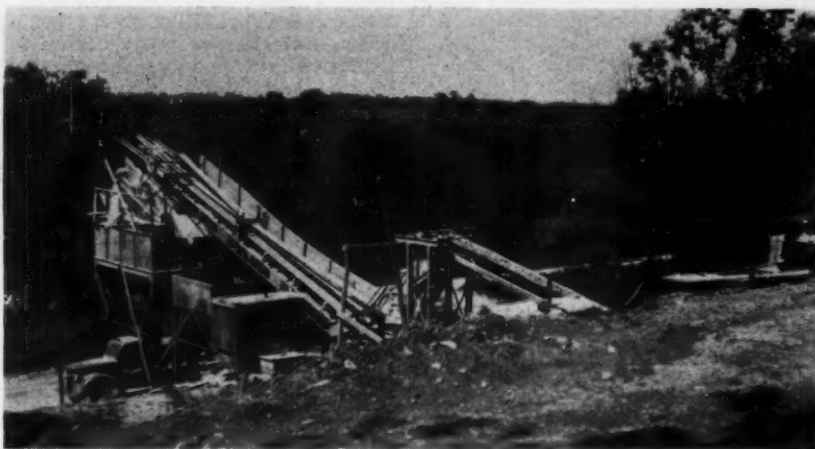
The rate of production is comparatively stable in the counties where there are large quarries. Also these counties are generally the leading producers as compared with those where there are a large number of small operations.

### Lime Production

The production of lime has been an important industry in Iowa. The last large plant, which utilized Hopkinton (Silurian) dolomite at Hurstville in Jackson County, was last reported in operation in 1931. Large quantities of lime were also produced in the Dubuque area.

### Production Trends

Production trends in the stone quarrying industry are on the up-



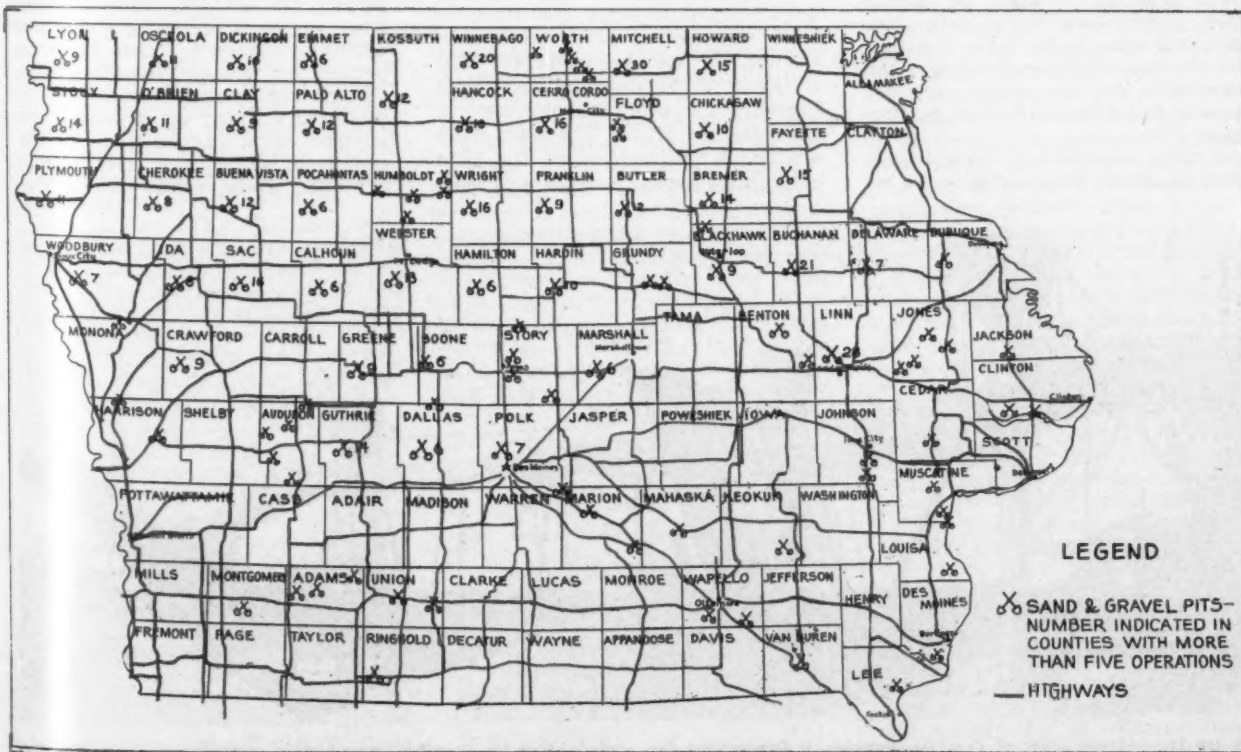
Capacity of this small, compact limestone plant of Farmington Gravel Co., Bonaparte, Iowa, is about 200 tons per day

swing in Iowa and have been since 1927 when the annual value first passed the million dollar mark. Only once since then, in the depression year 1932, has annual production dropped below one million dollars and in 1941, the last year considered to be normal, production was valued at more than 5.5 million dollars. The future looks bright, for in addition to the normal chief uses of stone, future production of agricultural stone is expected to be exceptionally high. Agronomists in Iowa estimated several years ago that in the following 10 years 60 million tons of agricultural limestone would be needed for

Iowa soils. Demand has greatly exceeded production for this purpose up to the present. Other uses of Iowa stone are for building blocks, rubble, flagging, curbing, flux, sugar manufacture, asphalt fillers, poultry grit and mineral food. There are numerous localities where the stone is suitable for rock wool manufacture.

### Cement Manufacture

Cement is the second most important mineral product in Iowa based on value of production, and Iowa is usually among the first ten cement producing states in the nation. It is manufactured in five large plants in



Map of Iowa showing sand and gravel plant locations. Highway lines in color



Iowa. Two are located at Des Moines, Polk County; two in Mason City, Cerro Gordo County; and one near Davenport, Scott County.

Pennsylvanian limestones and shales furnish the raw materials for the Des Moines plants. At Mason City the raw materials come from the Lime Creek and Shellrock formations of Devonian age, and in Scott County the raw materials are from the Devonian, Wapsipinicon and Cedar Valley formations. An inactive cement plant is located in Pocahontas County, where quarries in lower Mississippian limestone remain open and dry.

### Gypsum Manufacture

Gypsum is the most important mineral product in Iowa from a national point of view. In value of production Iowa has ranked among the first four states in the nation for many years and recently has yielded about 13 per cent of the United States total production. Crude gypsum is obtained from relatively shallow underground mines and open quarries in the Fort Dodge bed. It is sold crude or calcined, and a wide variety of gypsum products are made.

Fort Dodge, in Webster County, has always been the center of the gypsum industry in the State. The geologic age of these beds is not definitely established. Like many other gypsum deposits they were apparently formed by the evaporation of an inland body of water after late Pennsylvanian time. They rest on Pennsylvanian rocks and are overlain by glacial drift. Fossils and other indications have led some to the view that they are Permian, but the evidence is not conclusive. For this reason they are usually designated in writing as Permian (?).

Gypsum resources in Iowa are almost unlimited. In addition to the re-

serves in the Fort Dodge area, gypsum occurs in the Mississippian rocks, particularly in Appanoose, Mahaska, Monroe and Warren counties, and was once mined at Centerville. Much

of central Iowa is underlain by gypsum which occurs in the lower portion of the Devonian in the Wapsipinicon formation. Thus, large gypsum-bearing areas are undeveloped.

## Sand and Gravel Deposits

**G**LACIAL DRIFT, ALLUVIUM, and the Dakota (Cretaceous) formation furnish most of the materials used as sand and gravel in Iowa. Some sand is obtained from the St. Peter (Ordovician) sandstone and a small amount from other indurated sandstones. The chief uses of sand are for structural and paving purposes, and as molding, engine, blast, and filter sand. Gravel is used primarily for structural concrete aggregate, road metal, and railroad ballast.

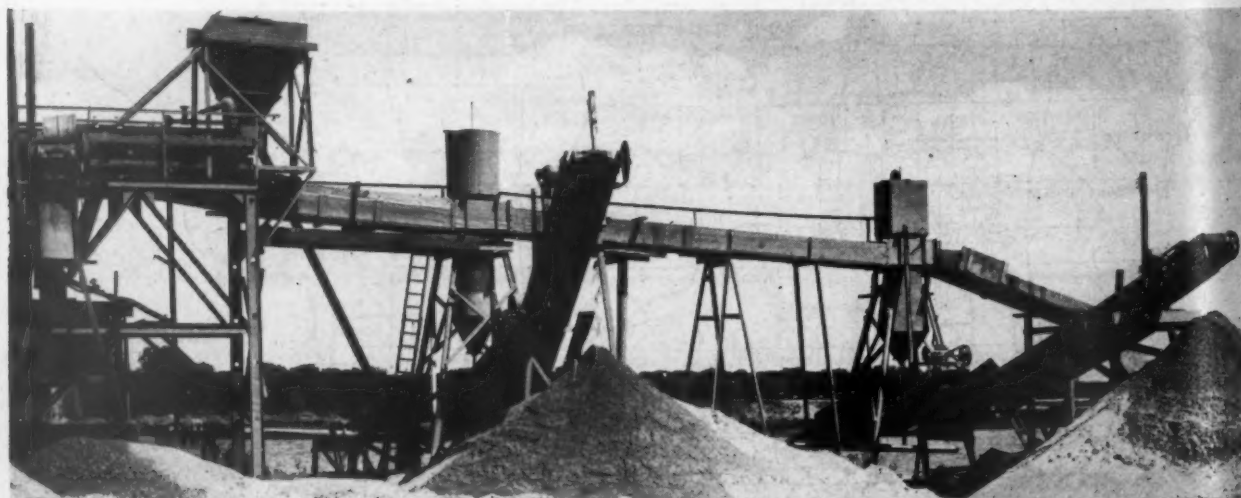
The area of largest production is the northern portion of the State, as may be seen from the map showing present sand and gravel pits. Almost all production in this area is from drift or alluvium. A comparison of this map with the map showing the distribution of drift sheets reveals the intimate relationship of sand and gravel production to the deposits left by the Iowan and Mankato glaciers. These two drifts are infinitely more productive than the Nebraskan, Kansan and Illinoian. The explanation of this seems to be that the largest deposits, aside from the more recent alluvial deposits, were formed within or in the immediate vicinity of the ice as it advanced. The Nebraskan and Kansan drifts, both relatively thick, deposited large quantities of sand and gravel which were later covered as the ice advanced. The thickness of this cover in most places prevents the profitable recovery of the sand and gravel. The later drifts are thinner and therefore the sand and gravel deposits are more acces-

sible. Other factors of almost equal importance are the morainal character of the later drifts and the direction of flow of the melt waters. The southern margins of the Iowan and Mankato drifts and their immediate outwash areas are within Iowa, but the Kansan and Nebraskan margins lie beyond the State borders.

Sands and gravels often occur separately in the river bed deposits, from which they are recovered by dredging. The materials of this type vary from fine-grained sands to coarse-grained gravels and within individual deposits are characteristically better sorted than the drift sand and gravel bodies.

### Upland and Terrace Deposits

The sands and gravels of northern Iowa may be divided into two types on the basis of the method in which they were deposited. They are the upland type and the terrace type of deposit. The upland type occur on the drift plains and are not associated with existing streams. They occur in the form of low hills, above, or sometimes as pockets level with, the glacial till plain. These sands and gravels are rather irregularly stratified but are generally poorly sorted. The textural range is broad both within a single exposure and between exposures. Generally the pebbles are smaller than 3 in., although cobbles and boulders may be scattered through the deposit. Sieve analyses show a broad range in texture from almost any layer in such deposits. These sands and gravels



At the Marshalltown plant of Concrete Materials & Construction Co., material from the deposit is pumped into a receiving box, upper left, which discharges to a double-deck horizontal screen. Gravel discharges to stockpile at the left, and sand launders to two settling tanks at the center and to the right. Sand from the tanks goes to screw washers for dewatering and then moves over belt conveyors to stockpiles.

have been used extensively for road surfacing throughout their area of distribution.

Terrace sands and gravels are found along the valleys of almost every stream in and near the Wisconsin drift area. These stratified deposits were laid down mainly by the heavily laden streams of Wisconsin and post-Wisconsin age. Many of the streams have since cut their channels deeper leaving terraces along the valley walls. In general these deposits are very much better sorted than the upland sands and gravels. In some places thick beds of material of rather uniform size may be found. The material is almost all smaller than 1½ in. in diameter.

The terrace sands and gravels are characteristically covered by an overburden, commonly of silty texture, varying in thickness from a few inches to a maximum of about 6 ft.

## Buchanan and Aftonian Deposits

Perhaps the most famous sands and gravels, geologically speaking, are the Buchanan and Aftonian deposits. The Buchanan sands and gravels were named from their wide occurrence in Buchanan County, and are distributed over most of northeastern Iowa. The Aftonian deposits were named from gravel pits in the vicinity of Afton Junction, Union County, but similar deposits are known to be scattered over southern Iowa. The former is Kansan or younger in age, and the latter is older than the Kansan. Both are believed to have been deposited during periods of glaciation.

The position of the Buchanan sands and gravels is normally beneath the Iowan till in northeastern Iowa. However, the Iowan is generally thin, and the Buchanan deposits are exposed in many places, permitting relatively easy exploitation, and large reserves are still available.

The pits at Afton Junction have yielded large quantities of material, principally for the railroads, in an area where sands and gravels are difficult to find. These deposits occur as pockets within the glacial drift. Most of them are associated with the oldest or Nebraskan drift sheet, but sands and gravels of similar type are known to occur in the overlying Kansan drift.

The Buchanan and Aftonian sands and gravels are very similar in character. They are generally stratified horizontally, but lenses and pockets are common. Sorting is poor, and there is a wide textural range within single exposures and in different exposures. Most of the gravel is less than ¾ in. in diameter, although there are beds which consist of pebbles, ranging between ½ and 1½ in. in diameter. Larger pebbles, cobbles and boulders are common in these deposits. One of the outstanding characteristics of the gravels is their



Launder at left carries impurities to waste at the Flint Crushed Gravel Co., Des Moines, Iowa. Launder to the right carries sand to classifiers for recovery of concrete and masons' sand

reddish brown color caused by oxidation of the iron minerals. In some places the carbonate pebbles have been leached out and some of the igneous rocks disintegrated from long exposure to the forces of weathering.

Areas of largest production of sand and gravel vary from year to year. In this respect sand and gravel is more variable than stone, but for the same reason—its use for road surfacing.

## Cretaceous Deposits

Material used as sand and gravel has been or is being obtained from the Dakota beds in Guthrie, Greene, and Montgomery counties. The Dakota sandstones and conglomerates in these areas are at or near the surface and are so loosely cemented that they behave essentially as sand and gravel, and are so considered for the purpose of this discussion. The composition of the "gravel" is a mixture of silicious elements, lacking in igneous rock fragments, probably from a distant source, and grains and pebbles from the rocks of Iowa older than the Dakota. They are sub-round to sub-angular, polished, pitted and fairly well sorted. The "sands" are somewhat better sorted, more angular and less polished than the gravel. Both are used primarily for paving purposes as concrete aggregate and road metal. Other exposures of Dakota sandstone are at Sioux City in the northern corner of Woodbury County and along the Big Sioux River farther north.

A comparison of the map showing sand and gravel pits and that showing stone quarries indicates these resources have been widely developed in eastern and northern Iowa. It indicates equally well that south-central and southwestern Iowa are not so well supplied.

The need of additional local sources of raw material for concrete aggregate,

road metal and agricultural purposes in south-central and southwestern Iowa is a most critical problem in the State.

## Industrial Sands

The St. Peter sandstone which crops out in a belt in eastern Iowa from Dubuque to the northern border of the State has been utilized for glass sand. It is a remarkably pure white sandstone made up of loosely cemented well rounded sand grains and is the same formation extensively used for glass making farther east in Illinois.

Molding sands of nearly all kinds occur abundantly in Iowa. Most of the deposits have originated from the work of several geologic agencies, but the wind has probably been the dominant agent. Much of the sand occurs in the form of ancient dunes, mounds and ridges, now covered with soil. The sources of the sand in these deposits were probably outwash material around the margins of the ice sheets. Also some of the molding sand deposits are found along the south and southeast edges of river valleys and on top of the bluffs along the same edges of the valleys. The deposits in such positions suggest that the sand was blown from the flood plains by prevailing west and northwest winds during glacial time.

In addition to the wind-laid deposits there are some of smaller size which are strictly alluvial in origin, having been formed as flood plain deposits and later covered. It seems most likely that the wind-laid sands are of Pleistocene age, but the alluvial deposits may be of more recent origin.

In many places the deposits are composed of alternating layers of sand and clay in such proportion that the deposit can be utilized directly without mixing with other ingredients.



## IOWA HIGHWAY SPECIFICATIONS

Iowa State Highway specifications, as written in 1937, contain slightly more rigid qualifications for sand for portland cement concrete than normal Federal specifications except in the 100-mesh requirement. As can be seen from the accompanying graph, the Iowa specifications restrict the 30-mesh size to 20 to 40 percent passing, while normal Federal specifications allow from 30 to 60 percent passing. While most specifications call for a minus 50-mesh percentage of particles, Iowa specifications omit this sieve and call for 0 to 5 percent passing 100-mesh as against the Federal requirements of 2 to 10 percent passing.

Presence of impurities in Iowa sand and gravel deposits necessitated strict regulations in the maximum permissible amounts in fine and coarse aggregate for concrete which are listed herein.

Portland cement shall comply with the requirements of the A.S.T.M. "Standard Specifications for Portland Cement," Designation C 9-30 or with the requirements of the A.S.T.M. "Tentative Specifications for High Early Strength Portland Cement," Designation C 74-30 T. High Early Strength Portland Cement will not be required unless specified in the Special Provisions.

## Fine Aggregate

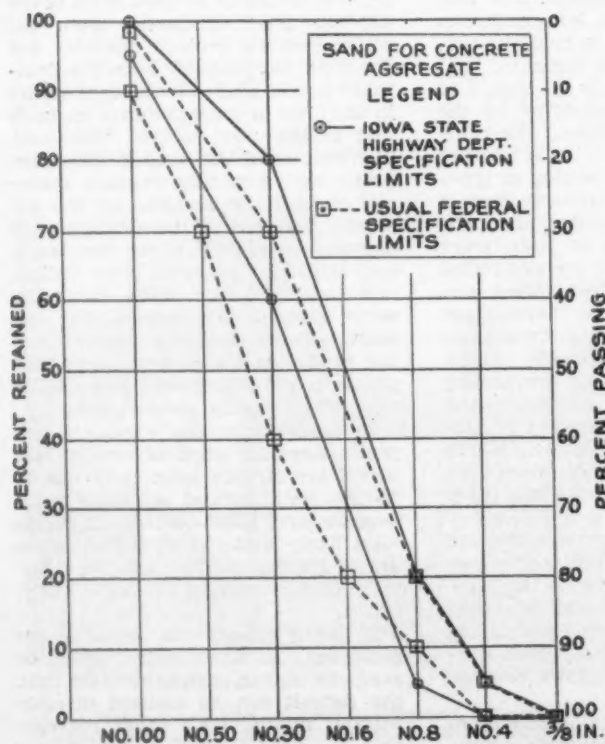
Fine aggregate for portland cement concrete must not contain more than

1.5 percent of shale or coal particles retained on a No. 14 sieve; not more than 1.5 percent of silt; and no more organic impurities (other than coal) than indicated by Fig. 2 when tested in accordance with the A.A.S.H.O. "Methods of Test for Organic Impurities in Sands and Concrete," method T-21.

Gradation requirements for fine aggregate are:

	Percent
Passing a $\frac{3}{8}$ -in. sieve.....	100
Passing No. 4 sieve.....	95 to 100
Passing No. 8 sieve.....	80 to 95
Passing No. 30 sieve.....	20 to 40
Passing No. 100 sieve.....	0 to 5

Strict compliance with these grading requirements may be waived if the sand complies with strength requirements mentioned below, and if laboratory studies of the concrete-making properties of the sand indicate that concrete of satisfactory strength can be produced by its use in the proportion specified. Strength is determined by testing mortar briquettes, cylinders, or prisms consisting of one part by weight of portland cement and three parts by weight of fine aggregate, mixed and tested in accordance with the methods described in the A.S.T.M. "Standard Methods of Sampling and Testing Portland Cement," Designation C77-32. The samples shall have tensile, compressive or bending strength at the ages of 7 to 28 days equal to that of 1:3 standard Ottawa sand mortar of the same consistency made with the same cement.



The sodium sulphate soundness test, Method T-76, is used for coarse aggregate. Coarse aggregate will be considered unsound if more than 20 percent of the particles are split when subjected to five alternations of this test, or when subjected to 16 alternations of the Freezing and Thawing test described in the A.S.T.M. "Standard Specifications for Drain Tile" Designation C4-24.

## Coarse Aggregate

Maximum percentage of objectionable substances are: 1.5 percent for silt and clay; 0.5 percent for clay lumps; 2.0 percent for the total of shale, unsound chert, and other kinds of materials whose disintegration is accompanied by an increase in volume which may cause the spalling of concrete or mortar in which they are contained; 0.5 percent of coal and carbonaceous shale; 0.8 percent for the total of shale and coal combined; 0.1 percent of sticks by wet weight; and 0.0 percent of organic matter other than coal or sticks.

Coarse aggregate shall not contain a combined total of more than 5 percent of the impurities listed above, plus any unsound particles not listed, plus particles having more than one-fourth their surface covered with a coating of shale or clay which is not dissolved when the aggregate is immersed in water for two minutes.

Sieve analyses for four mixes with three classes of aggregate (described later) are as follows:

(1) For use in Mix Nos. 1, 2, 3, or 4.

	Percent
Passing a $2\frac{1}{2}$ -in. sieve.....	100
Passing a $1\frac{1}{2}$ -in. sieve.....	95 to 100
Passing a $\frac{3}{4}$ -in. sieve.....	40 to 70
Passing a $\frac{3}{8}$ -in. sieve.....	10 to 30
Passing a No. 4 sieve.....	0 to 5

(2) For use in Mix Nos. 2, 3, or 4.

	Percent
Passing a $2\frac{1}{2}$ -in. sieve.....	100
Passing a $1\frac{1}{2}$ -in. sieve.....	80 to 100
Passing a $\frac{3}{4}$ -in. sieve.....	30 to 80
Passing a $\frac{3}{8}$ -in. sieve.....	10 to 40
Passing a No. 4 sieve.....	0 to 5

(3) For use in Mix Nos. 3 or 4.

	Percent
Passing a $2\frac{1}{2}$ -in. sieve.....	100
Passing a $1\frac{1}{2}$ -in. sieve.....	70 to 100
Passing a $\frac{3}{4}$ -in. sieve.....	20 to 90
Passing a $\frac{3}{8}$ -in. sieve.....	5 to 50
Passing a No. 4 sieve.....	0 to 5

Coarse aggregate shall conform to one of the following classes as specified in the contract:

**Class 1**—Coarse aggregate in this class shall consist of clean, sound, crushed trap rock, quartzite or granite and shall contain at least 85 percent of rock crushed from ledges having a percentage of wear of 5 or less.

**Class 2**—This coarse aggregate shall consist of gravel pebbles or crushed limestone. Crushed limestone shall consist of stone of which not less than 95 percent shall be crushed from ledges having a percentage of

(Continued on page 111)





Stone is hauled to the primary crusher in the quarry by 15-ton capacity tractor-trailer units at the River Products Co., Coralville, Iowa, plant

## PLANT PRACTICES

Iowa is well supplied with construction aggregates, stone as well as sand and gravel being plentiful throughout the State. The type of coarse aggregate used in highway construction is dependent upon the proximity to the source of supply, gravel or crushed stone being considered equally desirable.

Many of the sand and gravel deposits contain objectionable materials such as coal, shale, ochre, and clay. Around the Des Moines area, coal is the main impurity necessitating additional equipment for removal. In the northwestern portion of the State, ochre is found in the deposits, while shale appears scattered throughout the State.

Except in the eastern part of the State, the percentage of sand runs extremely high, in some cases as much as 90 percent in a sand and gravel deposit. Along the Mississippi River in the southern area, dredging operations reclaim sand and gravel, predominating in the fine sizes. Pit deposits in the eastern section, however, run a little better, and in at least one case, a deposit is being excavated where the gravel is present in a greater proportion than the sand.

At Iowa City, the Central Sand and Gravel Co. pumps from a bank deposit along the Iowa River. This deposit is typical of those high in sand, about 80 percent, and averages 25-ft. in thickness. The bank is cut down by a 55-ft. Eagle Swintex cutter, and the sand and gravel are pumped about 600-ft. to the plant by a 10-in.

Amsco pump. At the plant, the product discharges into a receiving box that feeds into a 4- x 12-ft. rotary screen with a sand jacket. The screen is divided into three 4-ft. sections with  $\frac{3}{4}$ -, 1-, and  $1\frac{1}{4}$ -in. openings on the three sections. Oversize, averaging about 5 percent of the total feed, drops into an 8- x 24-in. Universal jaw crusher, crusher throughs returning to the receiving box by bucket elevator. Gravel passing the inner screen and retained on the sand jacket, which is equipped with  $\frac{1}{4}$ -in. openings, drops into an Eagle screw washer, where water is added at the rate of about 400 g.p.m. Purpose of the washer is to remove shale and clay, the overflow from the screw washer going to waste by flume. The product from the screw discharges to the ground adjacent to the plant where it is picked up by a crane for stockpiling. Sand passing the outer jacket drops into a Telsmith sand tank where concrete sand is recovered. Overflow from this tank is laundered to another Telsmith tank where masons' sand is collected. The product from both tanks drops to the ground and is stockpiled by crane. Capacity of this plant is about 50 tons of sand and 10 tons of gravel per hour.

The sand and gravel plant of L. G. Everist, Inc., at Hawarden, employs three men at picker belts to remove ochre and shale, and also uses a battery of screw "deshalers" to remove impurities that escape the pickers. The screws are equipped with two

water pipes, one adding water at the top of the box, and the other spraying the product. The latter pipe is located at the bottom of the box and contains  $3/16$ -in. perforations spaced at 6-in. centers, through which water is sent to spray the load from the bottom to float off the impurities.

The deposit, a 30-ft. stratum of sand and gravel with about 40 percent gravel, is half under and half above the water. Two draglines are employed at the pit, one to load trucks with material from the upper 15-ft. bench, and the other to strip overburden and to stockpile material from the lower 15-ft. bench. It has been found practicable to dewater material from the lower bench by drainage through stockpiling before transportation to the plant so that the road to the plant can be maintained in a better condition than if a wet load were carried.

(An article on this plant appeared in ROCK PRODUCTS, Aug., 1946, p. 86.)

Hallett Construction Co., Boone, Iowa, trucks raw material from the pit, and sends it to the main plant by belt conveyor after preliminary screening and crushing. The product is scalped over a single-deck vibrating screen, oversize moving by a short belt conveyor to a cone crusher, crusher throughs returning to the first belt by another belt conveyor. The product passing the scalper drops to a long belt conveyor for movement to the top of the plant where it is sized in a rotary screen. Gravel is



Settling boxes under launder collect sand and discharge to belt conveyor underneath for transportation to storage bins at Automatic Gravel Co., Muscatine, Iowa

washed and foreign material is removed in an Eagle log washer, and sand is collected in Tel-smith sand tanks. This plant also employs pickers on the primary belt conveyor and the short belt to the crusher to remove large undesirable particles.

Flint Crushed Gravel Co., Des Moines, has long been troubled with veins of coal in its deposit. To rid the gravel of this impurity, an impact crusher has been installed in the plant to break up the coal, which is then washed out in two screw washers.

The deposit worked at this plant is 35 ft. thick, covered by an average of 3 ft. of overburden. A 10-in. Amsco counterflow pump pumps the material up to a portable dewatering plant where an old pump shell distributes it over an apron, 4½ ft. wide and 20 ft. long, set at an angle of 1 in. per 1 ft. At the far end of the apron, the feed drops down into a tank, with the vertical discharge extending downward about 8 in. below the water level in the tank. Overflow from this tank launders to waste, while the solids that settle in the bottom are drawn off into a bin through two manually-controlled gates, both 12 in. square. When more fines are desired, the discharge at the overflow end is raised by placing a 2- x 4-ft. board above it.

Solids discharge through the two gates into a 50-ton capacity hopper below the tank. This hopper, or surge bin, has air-operated discharge gates that allow the solids to be dumped into railroad cars underneath. A description of the air-controlled gates appeared in the September, 1944, issue of *Rock Products*, on page 42. Since that time, however, the gates are controlled from an operator's platform, and not from the locomotive as was described in that issue.

Material is carried in 8-ton capacity tram cars over narrow-gauge

track by a Plymouth locomotive with side-discharge into a hopper. The product discharges to a 28-in. feeder belt that in turn feeds to a 24-in. inclined belt conveyor, 200-ft. centers, sending it to the top of the main plant. The belt discharges over a Simplicity A-deck vibrating screen, with 1¼-, ¾-, 13/32-, and 3/16-in. sq. openings on the four decks, respectively. This screen was originally triple-deck, but the extra deck was added for scalping off oversize. Gravel over 1¼ in., averaging about three percent of the total feed to the plant, is sent into a 100-ton capacity bin, then to a Universal jaw crusher when enough oversize has accumulated in the bin. The crushed gravel drops to the ground, is picked up by a Barber-Greene loader and placed in trucks that move it back to the hopper where the raw material from the dewatering plant is received. The gravel retained on the second deck, from ¾- to 1¼-in., drops into a 30-in. Stedman impact-type, single-cage disintegrator. When coal is evident in the deposit, the product is crushed so that the coal will be ground fine enough to be washed away in following operations. When no coal is evident, the load drops through the disintegrator directly to screws underneath without being crushed. Gravel retained on the third deck, from 13/32- to ¾-in., drops directly to the screws, and the product retained on the lower deck, 3/16- to 13/32-in., either goes to the screws, or is stockpiled next to the plant as cover aggregate. Sand passing the lower deck is laundered to classifiers.

Gravel is washed in two Eagle screw washers, one a 22-in., and the other a 24-in., both in 14-ft. tubs. Overflow, carrying coal and other impurities, is flumed to a waste area. The product from the screws drops to a 3- x 8-ft. triple-deck Simplicity vibrating screen, with ¾-, 13/32-,

and 3/16-in. sq. openings. Product retained on the three decks is sized gravel, and drops to the ground adjacent to the plant, where it is picked up and stockpiled by crawler-type cranes. The material passing the lower deck is carried to waste through the same flume that carries the overflow from the screws.

While this may appear to be a double screening operation when one would suffice, it is necessary due to the presence of coal and shale in the deposit. The majority of the objectionable material has been found to be large enough when received from the pit to be retained on the ¾-in. screen. This size of material is then crushed in the disintegrator and another screening process is needed. By placing everything into the crusher before screening, the load would be too great and production would suffer. By scalping off the size between ¾- and 1¼-in., only the gravel that contains the greatest amount of deleterious matter is sent through the disintegrator.

Only the product passing the lower deck of the four-deck screen is reclaimed for sand. It is laundered to three Shaw classifiers where concrete sand is recovered. Overflow from the classifiers is laundered to small settling boxes for recovery of masons' sand.

Wash water is added at the four-deck screen through 4-in. pipes with perforations to spray the load; at the screw washers through pipes at the bottom of the tubs; and at the triple-deck screen through four spray pipes. The water is sent to the plant by an 8-in. and a 6-in. pump, at a rate of 2200 and 1500 g.p.m. Capacity of this plant is about 100 tons per hour.

At Marshalltown, the Concrete Materials and Construction Co. has started operations at a new all-steel plant, working a deposit that contains about 10 to 15 percent gravel. A 160-acre area with about 6-ft. overburden over a 30-ft. stratum of sand and gravel is being excavated by an 8-in. Amsco pump.

At the receiving box, the load is distributed to a 4- x 12-ft. double-deck Symons horizontal screen with 3/16-in. sq. openings on the lower deck and ½-in. sq. openings on six feet of the upper deck and 1¼-in. sq. openings on the remaining six feet of the upper deck. Gravel above 1¼-in. drops to a stockpile at one end of the plant. Gravel retained on the lower deck drops into an Eagle screw washer, 15 ft. long with 18 in. blades. Here it is thoroughly washed for removal of foreign matter such as clay and shales. Discharge from the washer is to a pile adjacent to the plant where it is picked up by a crane and stockpiled. Sand passing the lower deck is laundered to two Shaw classifiers where concrete and



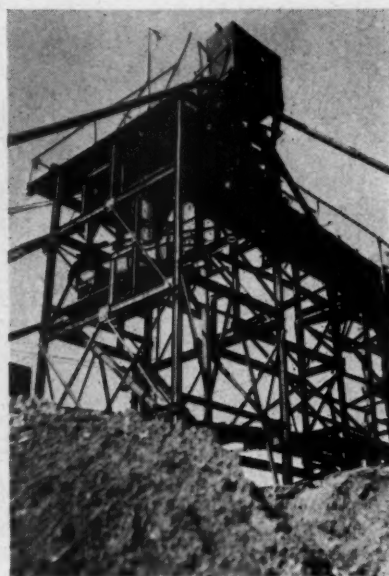
## OPERATING TRENDS

maisons' sand are recovered. Sand drops from the first classifier to an Eagle screw washer, 18 ft. long with 24-in. blades, where it is dewatered. Discharge from the screw is to a 20-in. Link-Belt portable belt conveyor, 36-ft. centers, that stockpiles the sand. The product from the second classifier goes into another Eagle screw washer, 12 ft. long with 22-in. blades, that discharges to a 20-in. stockpiling belt conveyor on 36-ft. centers. Trucks are loaded from stockpiles by crane. The Eddyville plant of the Concrete Materials Co. employs a trash remover, screw washers, and a picking belt to remove impurities in producing specification aggregate. The trash remover, similar to the one illustrated in the July, 1946, issue of *Rock Products*, on page 90, consists of a dredge pump shell fitted with a steel chimney. Material pumped by a 12-in. Amsco counter-flow pump into the shell follows a rotary course (centrifugal force) that causes the lighter sticks and trash to rise with the overflow water into the chimney, thence discharging to a waste launder. The aggregates are passed over a 4- x 12-ft. triple-deck Tyler Niagara screen. The launder to waste has an opening covered by a screen with  $\frac{1}{8}$ -in. openings for passage of the sand for recovery in a dewatering screw.

The triple-deck screen has  $2\frac{1}{2}$ -in. sq. openings on half of the top deck and  $\frac{3}{4}$ -in. sq. openings on the other half. The middle and lower decks

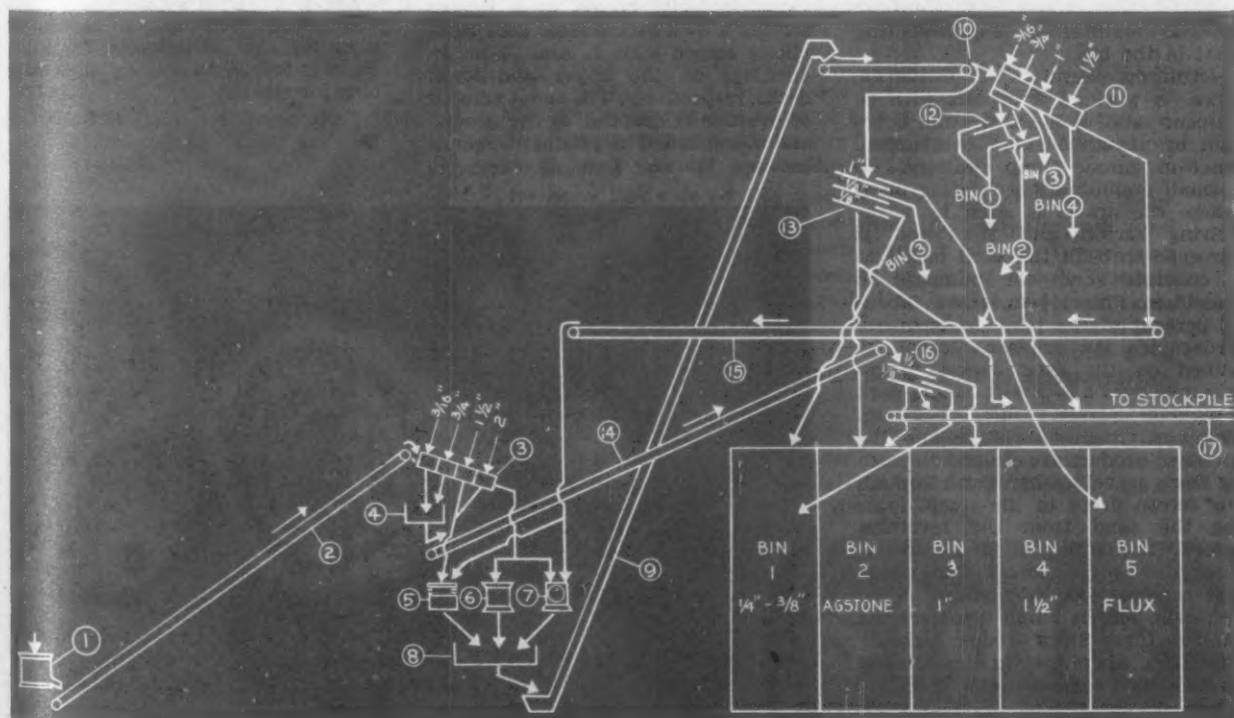
have  $\frac{3}{4}$ - and  $\frac{1}{8}$ -in. sq. openings, respectively. The product retained on all three decks is sent to a picking belt where coal, chert, shale, mud-balls, and sandstone are removed. Part of the sand passing the fine mesh is wasted, via a split discharge flume, the balance feeding a screw dewatering tank that also receives sand passing the screen in the waste flume from the trash remover.

The picking belt discharges to a 22-in. belt conveyor, 83-ft. centers, that feeds a 4- x 6-ft. single-deck Tyrock screen where oversize is scalped off and sent into a 10- x 36-in. Cedarapids jaw crusher. Crusher throughs return to the belt feeding the screen by a 20-in. belt conveyor, 16-ft. centers. The product passing the screen drops into two Eagle screw washers, both 12 ft. long with 18-in. diameter screws. Here the gravel receives an additional washing, with overflow going to a waste sump for eventual disposal into a pond some 500 ft. away. An 8-in. Amsco pump disposes of the wastes to a pond remote from the plant. The cleaned gravel from the screw washers is screened over a 2- x 8-ft. double-deck Simplicity screen with  $\frac{3}{4}$ - and  $\frac{3}{8}$ -in. sq. openings on the upper and lower decks, respectively. Gravel retained on both decks drops into a bin as a cover aggregate, and gravel (pea gravel) passing the lower deck is carried by a pipe to a bin adjacent to the plant or is diverted through another pipe to stockpile.



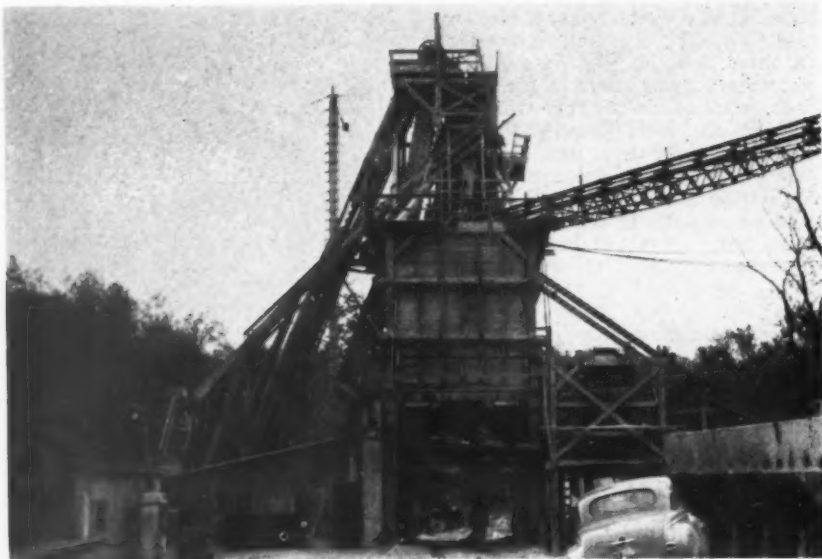
Material is pumped to receiving box at top of Cedar Rapids, Ia., sand plant, Concrete Materials & Construction Co., and then placed over screen. Sand is collected in cones to the right, and gravel (about 5 percent) drops to stockpile from trommel screen

The sand screened from the coarse aggregate and the sand reclaimed from the waste launder are recovered in four screw dewatering tanks, each 20 ft. long with 20-in. diameter screws. Discharge from the screws is to a 20-in. belt conveyor, 153-ft. cen-



Flow sheet of Dubuque Stone Products, Dubuque, Iowa, shows flexibility of operation. 1—Gyratory crusher; 2—Belt conveyor; 3—Trommel screen; 4—Surge bin; 5—Cone crusher; 6—Gyratory crusher; 7—Pulverator; 8—Surge hopper; 9—Bucket elevator; 10—Belt conveyor; 11—Trommel screen; 12—Vibrating screen; 13—Vibrating screen; 14—Belt conveyor; 15—Belt conveyor; 16—Vibrating screen; 17—Belt conveyor. Each bin holds 100 tons





To the left may be seen discharge end of conveyor which moves stone from the primary crusher in the mine to secondary crushers, Douds Quarries Co., Douds, Iowa. Stone is then elevated to the top of the plant for final sizing

ters, that carries it to the top of the plant for storage for further processing. Preliminary to production of masons' sand, this sand may be screened over a 2- x 8-ft. single-deck Simplicity screen with 6-mesh openings. Oversize then drops into a bin and the fines are recovered as masons' sand by a screw dewatering tank. When an excess of sand is present, the oversize from this screen can be piped directly to the waste sump. A stockpile of concrete sand is also maintained, supplementing that in the bin.

Ottumwa Sand Co., Ottumwa, Iowa, is working a deposit with 80 percent sand, a 20-ft. stratum overlain by about 10 ft. of overburden. An 8-in. Amsco pump discharges to a small preliminary separating plant where the gravel is sized by a revolving screen and the sand is screened through the sand jacket to a concrete sump for pumping to classifiers. Plus 1½-in. gravel, about 10 percent of the total, feeds into a Cedarapids jaw crusher. Gravel retained on the sand jacket is re-screened over a 3- x 4-ft. single-deck Simplicity screen with ¼-in. sq. openings. Crusher throughs and the screened product are cleaned through an Eagle gravel washer. Sand through the screen drops in the sump, joining the sand from the revolving screen. Discharge from the washer is stockpiled by a portable Cedarapids belt conveyor for stockpiling.

A 6-in. Morris pump transfers the sand to three Shaw (rising current) classifiers, where four grades of sand are classified consecutively. The classifiers are located on a steel trestle 66-ft. high, for ample stockpiling headroom. Overflow sand from the third classifier, being in the finer mesh size ranges, is utilized through

blending to meet rigid Federal specifications. Sand from the several piles is blended by a crane in loading railroad cars.

A small but efficient sand and gravel plant is operated by the Farmington Gravel Co. at Farmington, where principal production is concrete sand from a deposit containing about 95 percent sand. The plant is semi-portable, movable on skids by the excavating P. & H. dragline. Excavated material is fed to a hopper serving a 3- x 6-ft. double deck Simplicity screen with 1- and ¼-in. sq. openings on the upper and lower decks, respectively. The small amount of oversize is dropped to the ground and stockpiled. The product screened between ¼- and 1-in., is stockpiled

by a belt conveyor or loaded directly into trucks. Sand is put through an Eagle screw washer and dewatered for stockpiling by belt conveyor. Wash water is applied at the screen and at the screw washer at a rate of 400 g.p.m. by a 3-in. Buffalo pump. Rated capacity of the plant is 50 t.p.h.

To minimize pumping distance from the deposit, the Automatic Gravel Co., Muscatine, has built a small plant to size gravel while retaining its larger plant merely to reclaim the sand that was wasted in previous years. This new plant, while small, is compact, efficient, and is semi-portable so that it can readily be moved as the deposit is developed.

Material is pumped by a 12-in. Amsco pump into a receiving box at the plant, feeding to an 8- x 8-ft. gravity screen with ¼- x 4-in. slotted openings to remove the fines. Throughs drop into a sump for re-handling by an 8-in. Amsco pump. Gravel retained on the gravity screen is conveyed by belt to a box at a transfer station with another gravity screen, having ¼- x 4-in. slotted openings, to remove any water and fines that had not been removed at the first screen. Discharge from this box is by belt conveyor to a 4- x 6-ft. double-deck Tyrock vibrating screen, equipped with 1- and 3/16-in. sq. openings on the two decks, respectively. The three sizes from the screen are stockpiled by belt conveyors. Sand pumped to the old plant by an 8-in. pump is processed through a series of settling boxes equipped with screen cloth to set the desired sizes for sand. Discharge from the boxes is to a belt conveyor that feeds bins for storage.

Bellevue Sand and Gravel Co., Bellevue, Iowa, has an excellent de-

(Continued on page 90)



Mine operated by Douds Quarries Co., Douds, Iowa, has a 25-ft. ceiling and uses conventional room-and-pillar mining methods with pillars and rooms both about 40 ft. wide. Holes are drilled by drifters

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**OFF-THE-HIGHWAY TIRES**

## OPERATING TRENDS



Long, covered belt conveyor carries crushed stone from primary crusher in mine to main screening and secondary crushing plant above ground level. Douds Quarries Co.

posit of clean material, with gravel predominating. Recovery from the pit deposit is by shovel, loading a hopper in the pit that discharges to a belt conveyor for transportation to the plant. Gravel is sized by two batteries of three revolving screens and sand is processed and dewatered in a Link-Belt Rotoscoop. No special equipment is necessary to wash the product, and the material shipped meets all quality specifications. Sand and gravel from this plant was used in the construction of the new concrete highway between Bellevue and Dubuque during the Summer of 1946.

Concrete sand and gravel is recovered from the Mississippi river by the Molo Sand and Gravel Co., Dubuque, Iowa, from a spot about nine miles south of the city. Two dredges are employed and sizing is by trommel screens on the dredge boats. At Dubuque, Iowa, the barges are unloaded and the material is placed in stockpiles and bins by a stiff-leg derrick with a 110-ft. boom and a  $1\frac{1}{2}$ -cu. yd. bucket.

At Cedar Rapids, the Concrete Materials and Construction Co. excavates sand and a small amount of gravel from a pit deposit hydraulically, pumping to trommel screens. Sand is produced in three sizes by Link-Belt cone classifiers supported by a trestle that allows ample room beneath for stockpiling.

Welden Brothers at Iowa Falls combine a sand and gravel operation with a crushed stone and ready mixed concrete plants. The bulk of production in the stone plant, installed in 1946, is agricultural limestone, using a 42- x 48-in. Gruendler crusher and a 15- x 36-in. Universal jaw crusher.

The sand and gravel deposit is unusual for Iowa, since it contains a high percentage of oversize (plus  $1\frac{1}{2}$ -in.). A dry pit deposit is worked

and trucks deliver the pit run product into a hopper above an apron feeder. Screening is done over a 4-deck, 3- x 8-ft. Simplicity screen; crushing is handled by a 15- x 36-in. Iowa Manufacturing Co. jaw crusher and a 22- x 40-in. Diamond roll crusher; and sand is recovered in a sand drag.

At Waterloo, the Concrete Materials Co. operates a plant for the production of engine sand and foundry sand as well as concrete sand and gravel. A deposit about 40 ft. thick is worked. Pumped to the plant by a 10-in. Amsco pump, pit run is sent into a revolving screen with  $1\frac{3}{8}$ -in. circular openings. Oversize is fed to a 9- x 20-in. Cedarapids jaw crusher and throughs to a 7- x 10-ft. gravity screen with  $3/16$ -in. openings on the lower half and  $1/4$ -in. openings on the upper half of the deck. The product retained on the gravity screen is sent into one compartment of a two-compartment concrete sump, and the sand passing the screen is sent to the other compartment. Crusher throughs are also sent into the first compartment. The product in the first compartment is elevated by bucket elevator for screening in the production of concrete sand and gravel, while the material in the second compartment is elevated to screens for the recovery of fine silica sand for use as engine and foundry sand.

From the first compartment, a Link-Belt bucket elevator carries the product to a 3- x 8-ft. Tyler Tyrock vibrating screen with  $3/4$ - and  $1/2$ -in. sq. openings on the two decks, respectively. The gravel retained on both decks is put through an Eagle screw washer that discharges the  $1/2$ - to  $1\frac{1}{2}$ -in. products to a bin. Sand passing the lower deck is put over a 3- x 12-ft. double-deck Tyrock vibrating screen with  $3/16$ -in. openings on

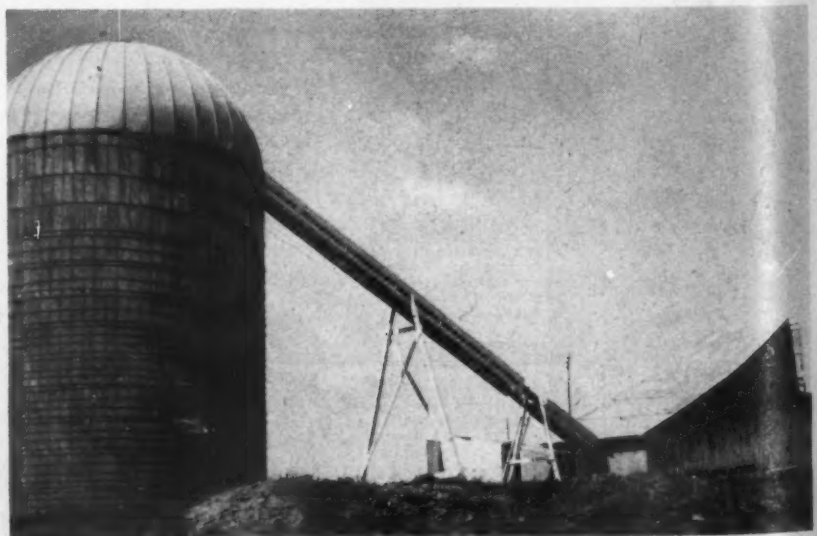
the upper deck and 0.074- x 3-in. openings on the lower deck. Oversize from this screen (pea gravel) is placed into a bin; material retained on the lower deck goes into another bin as concrete sand; and sand (engine) passing the lower deck is dewatered by a sand drag and stockpiled by belt conveyor. When more fines are desired in the concrete sand, the product passing the lower deck and the sand retained on the lower deck both go into the same bin.

Although some engine sand is made in the operation just described, the major tonnage is produced at the opposite end of the plant. A bucket elevator takes the fine sand collected in the second compartment of the sump and discharges it over two 3- x 6-ft. single-deck Simplicity screens with 0.031- x  $1/2$ -in. openings. Oversize is laundered back to the first compartment of the sump, and throughs drop into a sand drag. Discharge from the sand drag is to a belt conveyor to a loading tippie where cars are loaded. Production capacity is about 600 tons per day, of which 100 tons is industrial sand.

At the Ideal Sand and Gravel Company plant, Mason City, the available gravel has been depleted, so crushed limestone is mixed with sand and sent through the plant to produce concrete aggregates. Using surplus sand that was sent to waste during the previous years of operation, this company has been able to produce a sand that will readily meet specifications.

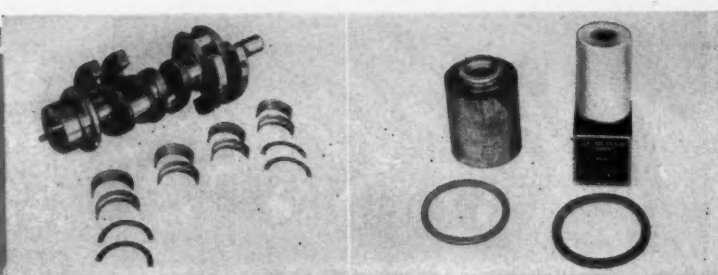
Sand is brought to the plant by truck and dumped into a hopper, with feed to a belt conveyor. Stone is also brought by truck and dumped into a feeder that sends it into an 18- x 36-in. Universal jaw crusher, crusher throughs joining the sand on the

(Continued on page 104)

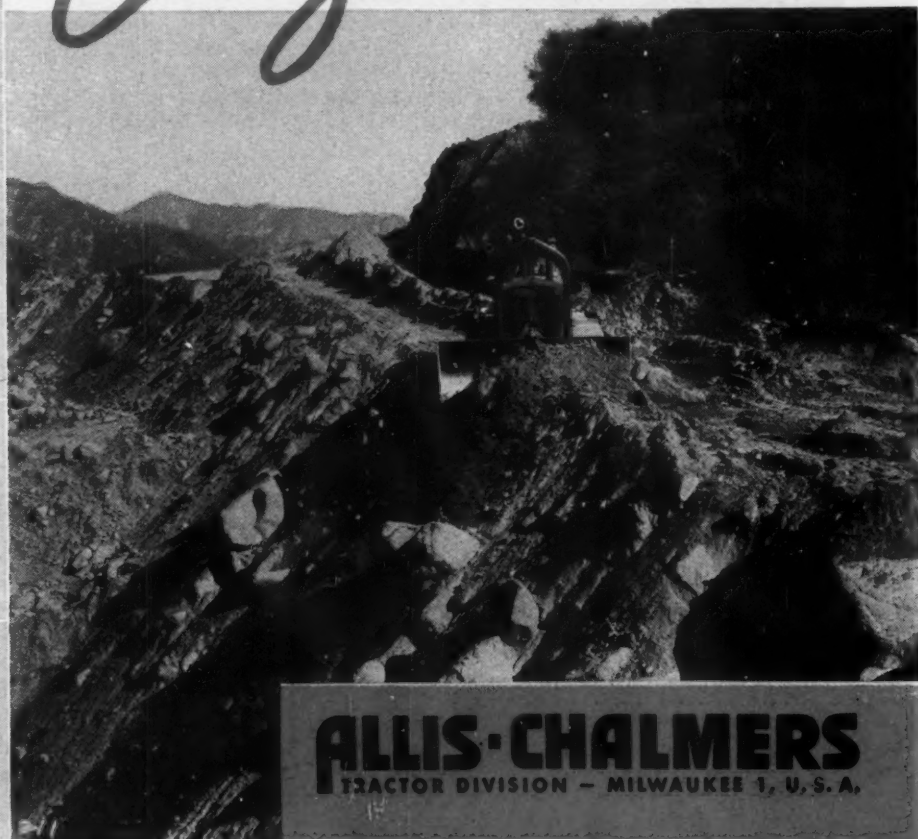
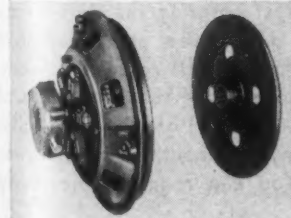
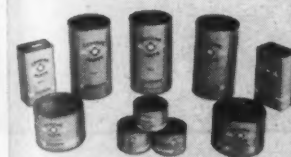
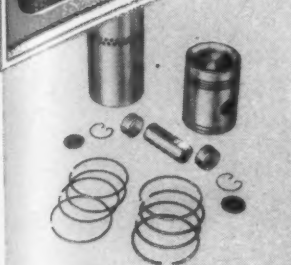


At the Best Lime Co. plant, Apilington, Iowa, agstone is stored in a concrete stove silo of 800-ton capacity with three manually-controlled discharge gates for truck loading





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Page 36

General Engineering Data

TABLE 1—WEIGHTS OF 1000 FEET OF STANDARD TUBES (WELDED OR RIVETED)

Nom. Size, in.	Wall Thickness, in.	Weight, lb.	
		Per Foot	Per 100 Feet
1/8	0.063	1.10	110
1/4	0.125	2.20	220
3/8	0.188	3.30	330
1/2	0.250	4.40	440
5/8	0.312	5.50	550
3/4	0.375	6.60	660
7/8	0.438	7.70	770
1	0.500	8.80	880
1 1/8	0.562	9.90	990
1 1/4	0.625	11.00	1100
1 3/8	0.688	12.10	1210
1 1/2	0.750	13.20	1320
1 5/8	0.812	14.30	1430
1 3/4	0.875	15.40	1540
1 7/8	0.938	16.50	1650
2	1.000	17.60	1760
2 1/8	1.062	18.70	1870
2 1/4	1.125	19.80	1980
2 3/8	1.188	20.90	2090
2 1/2	1.250	22.00	2200
2 5/8	1.312	23.10	2310
2 3/4	1.375	24.20	2420
2 7/8	1.438	25.30	2530
3	1.500	26.40	2640
3 1/8	1.562	27.50	2750
3 1/4	1.625	28.60	2860
3 3/8	1.688	29.70	2970
3 1/2	1.750	30.80	3080
3 5/8	1.812	31.90	3190
3 3/4	1.875	33.00	3300
3 7/8	1.938	34.10	3410
4	2.000	35.20	3520
4 1/8	2.062	36.30	3630
4 1/4	2.125	37.40	3740
4 3/8	2.188	38.50	3850
4 1/2	2.250	39.60	3960
4 5/8	2.312	40.70	4070
4 3/4	2.375	41.80	4180
4 7/8	2.438	42.90	4290
5	2.500	44.00	4400
5 1/8	2.562	45.10	4510
5 1/4	2.625	46.20	4620
5 3/8	2.688	47.30	4730
5 1/2	2.750	48.40	4840
5 5/8	2.812	49.50	4950
5 3/4	2.875	50.60	5060
5 7/8	2.938	51.70	5170
6	3.000	52.80	5280
6 1/8	3.062	53.90	5390
6 1/4	3.125	55.00	5500
6 3/8	3.188	56.10	5610
6 1/2	3.250	57.20	5720
6 5/8	3.312	58.30	5830
6 3/4	3.375	59.40	5940
6 7/8	3.438	60.50	6050
7	3.500	61.60	6160
7 1/8	3.562	62.70	6270
7 1/4	3.625	63.80	6380
7 3/8	3.688	64.90	6490
7 1/2	3.750	66.00	6600
7 5/8	3.812	67.10	6710
7 3/4	3.875	68.20	6820
7 7/8	3.938	69.30	6930
8	4.000	70.40	7040
8 1/8	4.062	71.50	7150
8 1/4	4.125	72.60	7260
8 3/8	4.188	73.70	7370
8 1/2	4.250	74.80	7480
8 5/8	4.312	75.90	7590
8 3/4	4.375	77.00	7700
8 7/8	4.438	78.10	7810
9	4.500	79.20	7920
9 1/8	4.562	80.30	8030
9 1/4	4.625	81.40	8140
9 3/8	4.688	82.50	8250
9 1/2	4.750	83.60	8360
9 5/8	4.812	84.70	8470
9 3/4	4.875	85.80	8580
9 7/8	4.938	86.90	8690
10	5.000	88.00	8800
10 1/8	5.062	89.10	8910
10 1/4	5.125	90.20	9020
10 3/8	5.188	91.30	9130
10 1/2	5.250	92.40	9240
10 5/8	5.312	93.50	9350
10 3/4	5.375	94.60	9460
10 7/8	5.438	95.70	9570
11	5.500	96.80	9680
11 1/8	5.562	97.90	9790
11 1/4	5.625	99.00	9900
11 3/8	5.688	100.10	

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Get full details *now* on these speedy, convertible shovels that cut material handling costs to "rock bottom".

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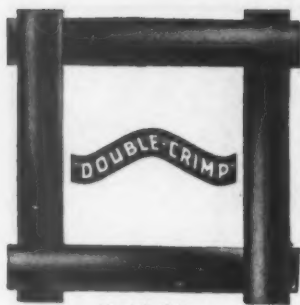


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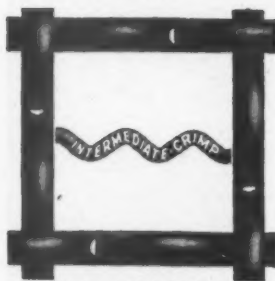




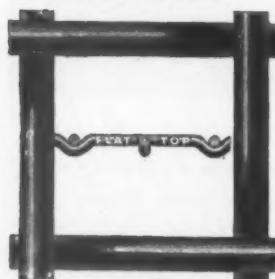
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Arch-Crimp



Intermediate-Crimp



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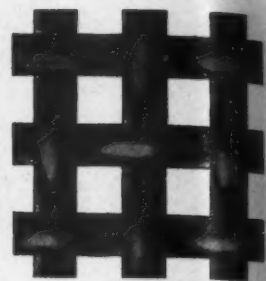
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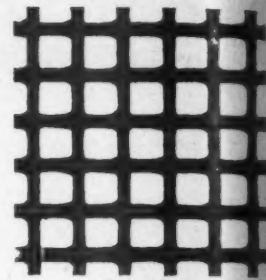
We invite your inquiries for wire cloths of all commercial metals or alloys or weaves, in continuous lengths or cut to size, or processed to meet your individual requirements.

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Nickel-Chromium Alloys	Filter	Cutting	Discs
Aluminum	Flat-Top	Dipping	Forms
Brass	Herringbone-Twill	Dishing	Leaves
Bronze	Intermediate-Crimp	Flanging	Lengths
Commercial Phosphor	Rek-Tang	Flattening	Panels
Copper	Selva-Edge	Forming	Pieces
Monel Metal	Straight-Warp	Framing	Racks
Nickel	Stranded	Galvanizing	Ribbons
Any special alloys available in rod or wire form	Sta-Tru	Painting	Rolls
	Twisted-Fill	Shearing	Sections
	Twisted-Warp	Sitting	Segments
		Trimming	Spacers
		Arc-Welding	Strips
		Gas-Welding	Template shapes
		Spot-Welding	Trays

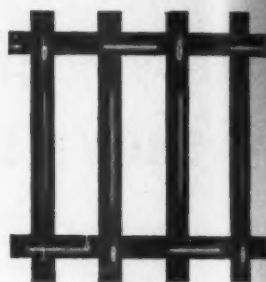
We will follow your specifications and blue-prints exactly as your production engineers have prepared them—or we will submit suggestions for your approval.



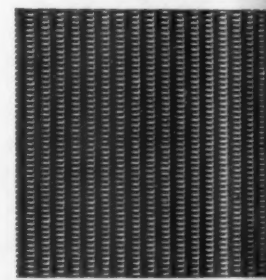
Double-Crimp



Galvanized



Rek-Tang

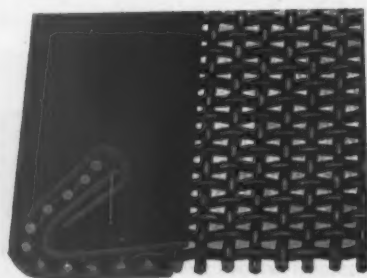


Dutch Weave

## The LUDLOW-SAYLOR WIRE COMPANY

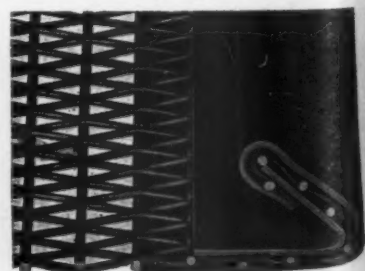
Newstead Avenue & Wabash Railroad

ST. LOUIS 10, MO.



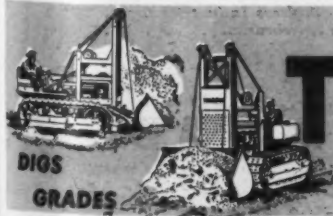
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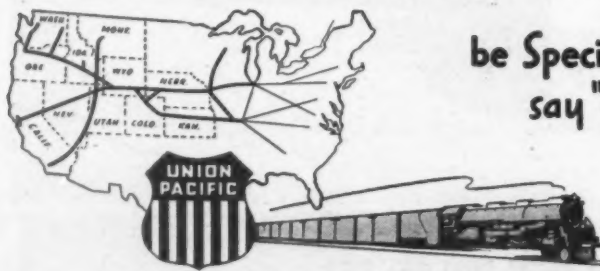


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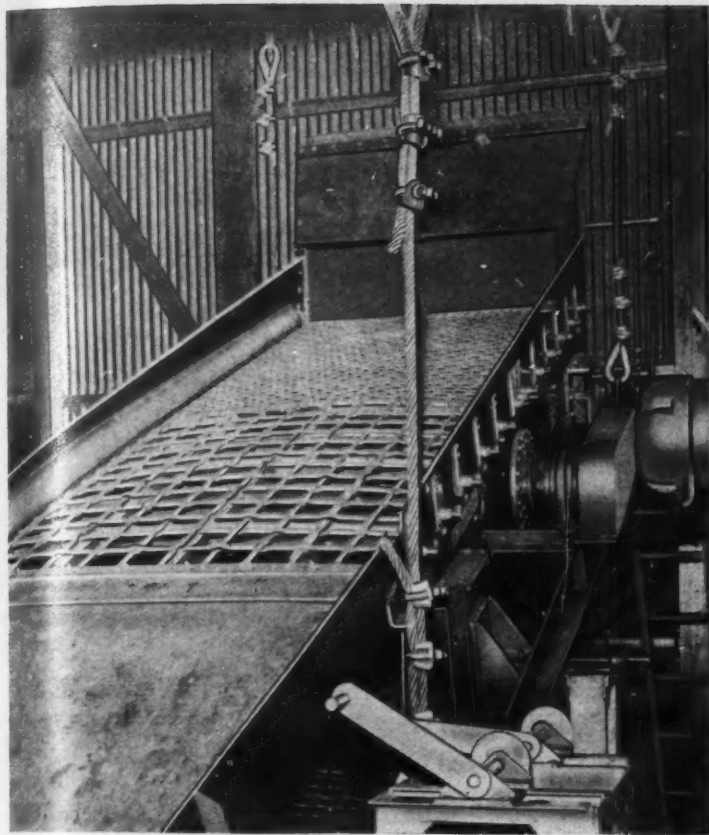
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★ Union Pacific will gladly furnish confidential information regarding available industrial sites having truckage facilities in the territory it serves. Address Industrial Dept., Union Pacific Railroad, Omaha 2, Nebraska.

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*The Strategic Middle Route*



# Simplicity Heavy Duty Scalper...



This 5' x 12' heavy duty double deck Simplicity screen completely separates 800 t.p.h. Top scalper deck passes 5 1/2" material.

## WHY SIMPLICITY SEPARATION EQUIPMENT IS TOPS

1. Counterbalanced eccentric shaft. Counterbalance machined directly on shaft to exactly balance the weight of entire vibrating screen deck.
2. Heavy duty spherical roller bearings in dust-proof, water-proof housings. Six alemite fittings lubricate entire unit.
3. Rubber Cushioned Power. Rubber corner supports insure positive gyrating action and eliminate excessive structural wear.
4. Four-way tension, double-crowned screening surface insure accurate sizing, stop whip action.
5. Sturdy all-steel construction. I-Beam frame. Every welded part stress relieved in our own electric oven.

*gives  
Complete  
Separation*

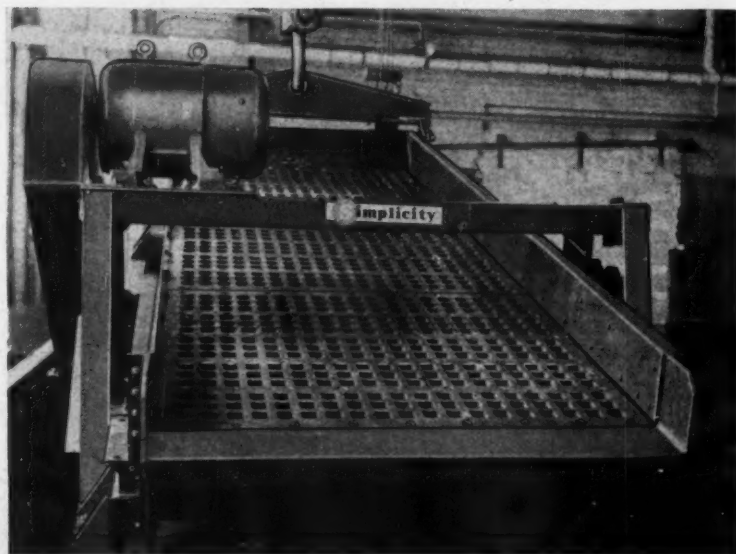
Leading rip rap producers use the Simplicity Heavy Duty Scalper to produce larger tonnages of material meeting the required specifications at a minimum cost.

Crushed Stone producers increase capacity with the Simplicity Scalper by reducing material handling. In one operation, replacing a stationary grizlie with a Simplicity Heavy Duty Scalper increased by 20% the material passing a two-inch opening. Resulting increased plant capacity paid for the installation in a short time.

Simplicity Heavy Duty Scalpers are built to stand the impact of four to five-foot boulders yet give the same high production and complete separation of the Simplicity Gyrating Screen. The same advanced engineering principles, the same fine materials, the same superb craftsmanship are built into all Simplicity separation equipment, regardless of its purpose.

Our latest plant expansion again increases our production of these popular Simplicity units. Write for complete information and expert engineering aid.

20% more 2" material passes this 5' x 14' Simplicity Heavy Duty Scalper than the stationary grizlie it replaced. Handles 900 t.p.h.



# Simplicity

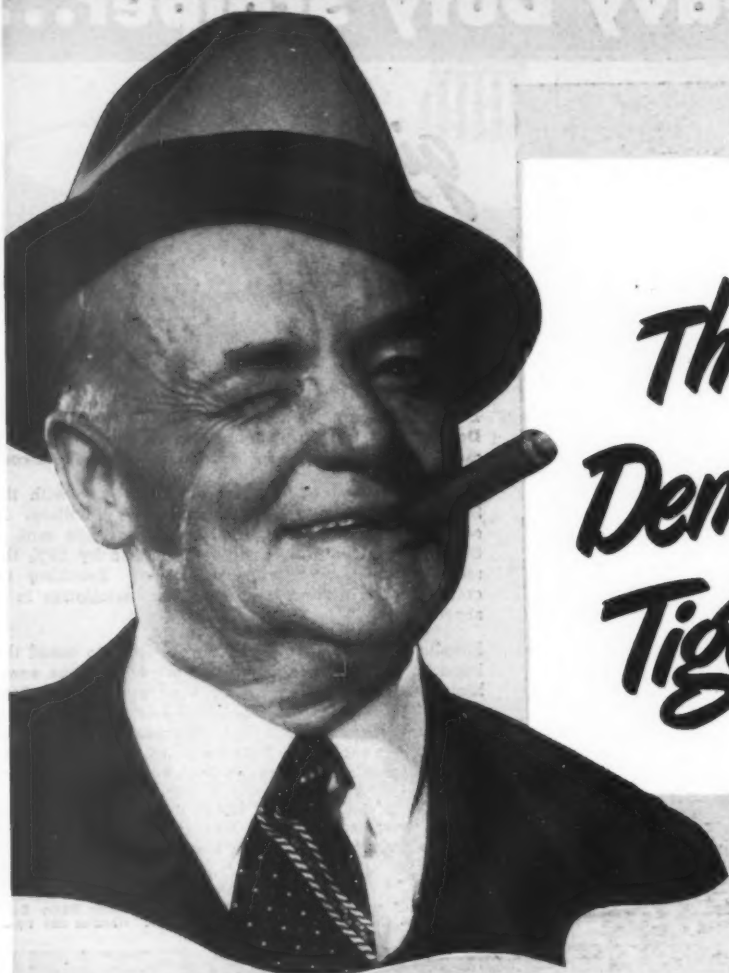
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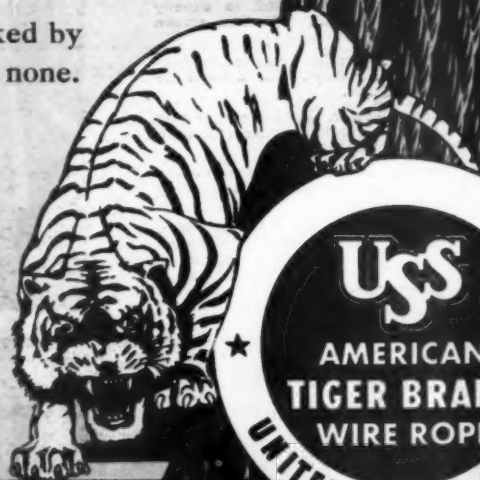
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# INFORMATION

You can obtain catalogs listed on these pages by merely checking and mailing the coupon below.

## TO HELP YOU MEET TODAY'S PROBLEMS AND TO MAKE PLANS FOR TOMORROW

- 1 **AIR ENTRAINING AGENT**—Dewey & Almy Chemical Co. has released two pamphlets on air entraining agents entitled "Manual for Using Darex AEA" and "Controlled Air in Air-Entrained Concrete" showing by tables and examples how to figure the quantity and estimate the amount of AEA for various mixes and control the amount of air entrained in concrete.
- 2 **BAGS**—Bemis Bro. Bag Co. has released a book entitled "Seven Facts About Low-Cost Protective Packaging" featuring waterproof paperlined textile bags for products that require special protection.
- 3 **BELTING**—B. F. Goodrich Co. has published a new 28-page booklet describing and illustrating flat transmission belting, conveyor belting, fractional horsepower V-belts and sheaves, multi-V-belts and sheaves, etc.
- 4 **BELTS**—B. F. Goodrich Co. has released catalog section 2155 on Plylock belt joints, describing and illustrating how to make rubber belts endless by the Plylock method. Advantages of the belt joint are listed and illustrations of Plylocked belts in service are given.
- 5 **CLUTCH**—Hardinge Co., Inc., has released Bulletin No. 45 describing and illustrating the BLM "Auto-Centri" clutch which is available in sizes from fractional horsepower to 5000 hp. for any type of power drive. Clutch operational data is given, also typical applications of various types of drives used with the clutch. Dimensions of Types P and S clutch, and ratings for Type P clutch are shown on a separate supplement.
- 6 **COMBUSTION**—Cities Service Oil Co. has published a booklet entitled "Combustion Control" describing and illustrating heat provers for improving combustion efficiency on internal combustion engines of all types, steam boiler plants, kilns, etc. The prover weighs about 25 lb. and operates electrically on alternating current 25 or 60 cycle, and on 110 or 120 volt current. Typical applications and charts are also given.
- 7 **CONSTRUCTION EQUIPMENT**—C.I.T. Corp. has published two booklets explaining a special financing plan for purchasing and selling construction equipment. One booklet, directed to contractors, tells how the company furnishes capital for purchase of machinery and equipment. The other booklet is for use of distributors and dealers and explains how the company finances purchases and sales of construction equipment.
- 8 **CONTROLS**—Combustion Control Corp. has published Bulletin 102-C and Bulletin 103-C, describing and illustrating Flame photoelectric flame-failure safeguard and boiler feedwater controls for boilers, heaters, furnaces, heat-treating ovens, kilns, etc. Specifications, dimensional drawings and sketches are included.
- 9 **COUPLINGS**—American Flexible Coupling Co. has issued a new catalog No. 40 describing and illustrating flexible couplings. Engineering data, load factors and information on installation and operation are also given.
- 10 **CRANES**—American Hoist & Derrick Co. has issued a general catalog, Form GC1, describing and illustrating locomotive and revolving cranes, ditchers, pile drivers, cane handling machinery, material elevators, derricks, hoists, car pullers, etc.
- 11 **CRANES**—R. G. LeTourneau, Inc., six-page folder, Form No. C-633, describes and illustrates various on or off-the-road uses of the Tournacranes. A chart showing lifting capacities at various reaches is included.
- 12 **DIESELS**—Caterpillar Tractor Co. has published a 16-page bulletin, Form 9093, entitled "Long Life-Expectancy," describing and illustrating various models of Diesels and owners' recorded experiences with these Diesels. Also Form 9148, entitled "Today's Answer Man" emphasizing that the Caterpillar dealer is the best source for obtaining a capable analysis of job requirements, right type and size of equipment, and parts and service.
- 13 **DIESEL LOCOMOTIVES**—Diesel Engine Manufacturers Association has published an 8-page booklet entitled "Diesel Locomotives," describing and illustrating Diesel locomotives used by mines, quarries, construction projects, etc.
- 14 **DIFFERENTIAL**—Thornton Tandem Co. has issued an operation and maintenance manual and service parts list for automatic-locking differentials. Construction, installation and servicing procedure for Types G and J are included.
- 15 **DUMP TRUCKS**—Maxon Construction Co., Inc., has issued a bulletin entitled "The Logical Tool for Handling Air-Entrained Concrete" describing and illustrating 2- and 4-cu. yd. capacity Dump-
- crete trucks. Outstanding features and dimensions of the two models are also given.
- 16 **FANS**—Manufacturers Equipment Co. has published Catalog No. 42 describing and illustrating portable kiln fans, vibrating screens, bucket elevators, feeders, roll crushers for fine grinding, also instruments for dryers and kilns.
- 17 **GEARS**—The Texas Co. publication Volume 31, No. 9, contains an interesting article on gear lubrication. It treats on the cause of gear failures, types of gears, nature of lubricant, conditions of operation, methods of gear lubrication. It also gives a schedule of lubricants for different types of gears.
- 18 **GOVERNORS**—Monarch Governor Co. has issued a 4-page bulletin No. CC-645, describing and illustrating a new model of governor that is centrifugally controlled. Installation instructions, parts list and prices, and schematic drawings are also included.
- 19 **GRADERS**—Allis-Chalmers Mfg. Co. has released a 32-page catalog form No. MS-300A describing and illustrating the AD motor grader. The booklet stresses capacity, performance, design, blade construction and range, electric brakes, and also includes data concerning weights, lifting mechanisms, fuel capacities and engine dimensions.
- 20 **HOSE**—B. F. Goodrich Co. has released catalog section 3700 describing

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and illustrating suction hose for sand and gravel service. Also described are Armored dredge sleeves for flexible connections on discharge pipe lines.

- 21 **IDLERS**—Chain Belt Co. has issued a new 26-page bulletin, No. 463, describing and illustrating REX belt conveyor idlers. Photographs, tables, charts, diagrams and cutaway views of the idlers are also shown.

- 22 **LUBRICATORS**—Balcrank, Inc., has issued a bulletin, Form No. 2120, describing and illustrating various types of lubricating equipment such as gear, chassis, joint and wheel bearing lubricators, also hand-operated grease guns. Specifications, gear oil and gear oil hose and assemblies, couplers and adapters and general utility items are also shown.

- 23 **MATERIALS HANDLING**—Allen-Sherman-Hoff Co. has released Bulletin No. 744, describing and illustrating materials handling equipment which consists of a suitable means of feeding material, a pipe line for conveying the material and a vacuum producer. Flowsheets are included showing how the system handles both dry and wet materials.

- 24 **MOTORS**—Crocker-Wheeler Division of Joshua Hendy Iron Works, has issued a four-page bulletin describing and illustrating sealed-power motors for use in dusty locations and in places where there is excessive moisture. It is available in sizes from 2- to 15-hp. Also included is a detailed description of the motor, cutaway view and pictures of typical applications.

- 25 **MOTORS**—Electric Machinery Mfg. Co. 4-page folder No. FF-11 describes and

illustrates economies and operating advantages in use of synchronous motors engineered to large, constant-speed drives. Examples of motors direct-connected to various types of drives are given.

- 26 **PROTECTIVE CLOTHING**—B. F. Goodrich Co.'s 10-page catalog section, 12000, describes and illustrates protective rubber coats, suits, sleeves, boots, aprons, hats, gloves and footwear for workers in the construction, agricultural, transportation, and chemical fields.

- 27 **PUMPS**—Marlow Pumps has issued Bulletin No. M45 describing and illustrating diaphragm pumps available in 3- and 4-in. single and 4-in. double sizes, with capacities from 3000 to 9000 gal. per hour. Special features and specifications are also given.

- 28 **PUMPS**—National Supply Co.'s new 16-page bulletin No. 321 describes and illustrates type C-250 power slush pumps. General and special features, performance chart, specifications and blueprint are also included.

- 29 **SCREENS**—Morrow Mfg. Co. new Bulletin No. 70 describes and illustrates perforated metal screens for sizing and grading sand and gravel, stone and other bulk materials. Data tables, specifications and standard practice information on flat, step, conical and cylindrical screens are also included in the bulletin.

- 30 **SCREENS**—Robins Conveyors, Inc., has released a new Bulletin No. 111-A describing and illustrating Elliptex screens designed for horizontal installation. Mechanical features, specific applications for dewatering, heavy-media dewatering and asphalt plants are also given. Dimensions and clearances in the single, double and triple deck types are clearly stated.

- 31 **SHAKEOUTS**—Robins Conveyors Bulletin No. 128 describes and illustrates a portable car shakeout, weighing 8 tons that can be placed on top of a hopper-bottom car by a standard, electric hoist or yard-crane. A 20-hp. motor provides power through a V-rope drive.

- 32 **THICKENERS**—Hardinge Co., Inc. has published Bulletin No. 31-D describing and illustrating thickeners, clarifiers and agitators for rock products plants. Tables giving data on specific thickening and clarifying operations are included in the bulletin.

- 33 **TIRES**—B. F. Goodrich Co. has published a 38-page booklet entitled "How to Save Money on Industrial Hauling Jobs and Equipment" describing and illustrating cushion, pneumatic, and pressed-on tires, together with instructions on care and maintenance. Specifications, descriptions of scientific tests and complete data on each tire are also included.

- 34 **TRACTOR EQUIPMENT**—R. G. LeTourneau, Inc., has issued an 8-page folder, Form G-1068, designed to assist equipment owners and operators in selection of proper tractor tools. Folder describes and illustrates various models of carryall scrapers, tilt-dozers, cranes and power control units, also typical applications.

- 35 **TRACTORS**—Caterpillar Tractor Co. has issued a 12-page booklet, Form 8965, describing and illustrating track-type and wheel-type tractors and the advantages of each type for certain kinds of work, such as power work, slow speed hauling and high speed hauling.

- 36 **TRUCKS**—Sterling Motors Corp. has issued three bulletins, Nos. 7442M, DJ-8541 and Form No. 10454M, describing and illustrating various models of heavy duty trucks and tractors equipped with dual chain drives to eliminate tire scuffing.

- 37 **TRUCKS**—R. G. LeTourneau, Inc. has released a 4-page folder, Form No. TT-100, describing and illustrating the Tournatruck for off-road trucking. Typical applications are shown, also adaptability by using the prime mover with carryall scrapers, Tournacranes and Tournatrallers.

- 38 **VALVES**—O. C. Keckley Co. has issued a 40-page catalog, describing and illustrating steam and liquid control equipment, including precision pressure regulating valves, pump governors, temperature regulators, water gauges, gauge cocks, illuminators, and steam traps.

- 39 **WASHERS**—Eagle Iron Works 28-page bulletin No. 46 describes and illustrates sand, gravel and ore washing and classifying equipment, including log, screw and fine material washers, dehydrators and classifiers, shale removers, sand tanks, etc. Typical installations and specifications are included.

- 40 **WELDING**—United Welding Co. has published a manual entitled "Tailoring in Metal" as a service to engineers and designers in determining what products can be welded advantageously and to provide design information for quality improvement and fabricating economy. Various types of welds are explained, and how they affect static and fatigue load values.

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# Diesel Engine

# DANGER points



*Air ports clogged after operation on uncompounded oil.*

## Clogged Ports Reduce Efficiency

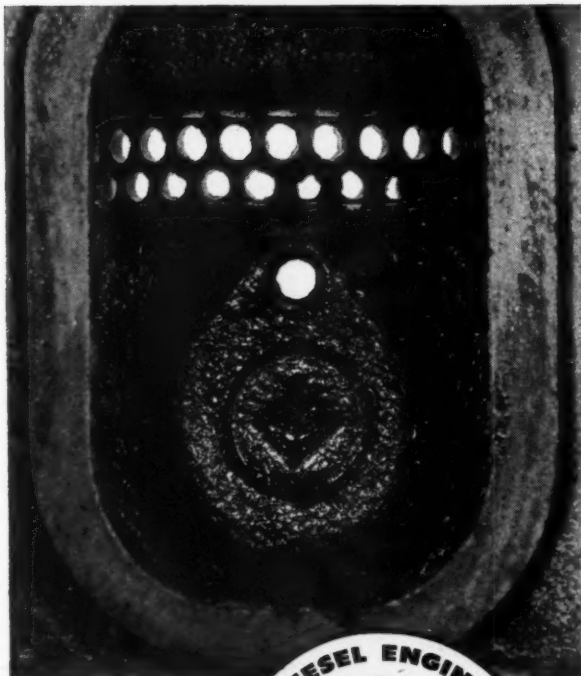
To the operator of a two-cycle Diesel engine, the clogging of air ports can become a serious problem. Deposits on air ports are composed largely of fuel soot and oxidized products. These contaminants reach the lower cylinder when sluggish or stuck piston rings permit blow-by.

*How RPM DELO Oil keeps air ports open.*

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RPM DELO Oil keeps air ports clean three ways:

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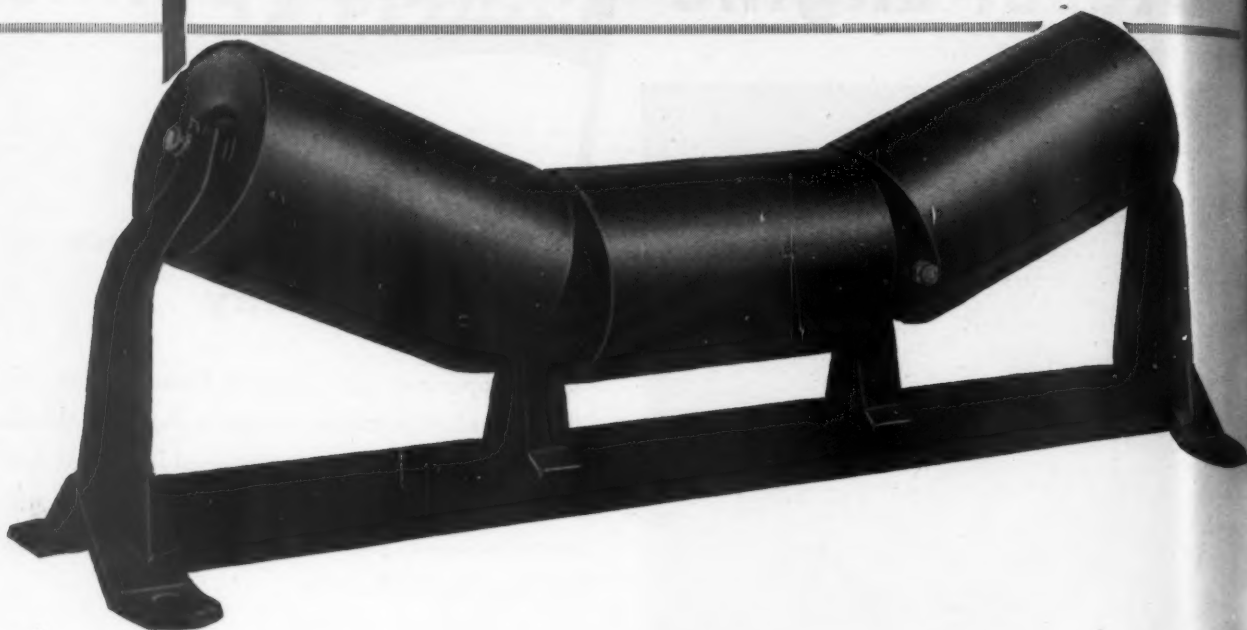


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• B-G Belt Carriers enable many operators to look ahead toward long years of low-cost material-moving service. Skillfully welded, practically unbreakable, they roll on bearings that are sealed to keep grease in—dust out. Their maintenance demands are next to nothing.

They are equally preferred among fore-

sighted plant superintendents for replacing wornout carriers—and for use in modernizing entire materials-handling operations. Belt widths 16" to 48", in various types. For information on Barber-Greene Belt Conveying Equipment, see your B-G representative. Barber-Greene Company, Aurora, Illinois.



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Standardized units, rigidly constructed, factory aligned, for easy assembly on the job. 12", 24" and 42" depths.



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Simple, self-contained units quickly erected—available in 8 and 9 foot lengths.



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Speed production . . cut costs

**Hydraulic Control**—smooth, velvety action; less operating effort. Gives a real "feel" of the load; faster response. Easier on machine and operator, too.

**True Tractor Type Crawlers**—the most dependable action ever put on an excavator. It's easier to get around.

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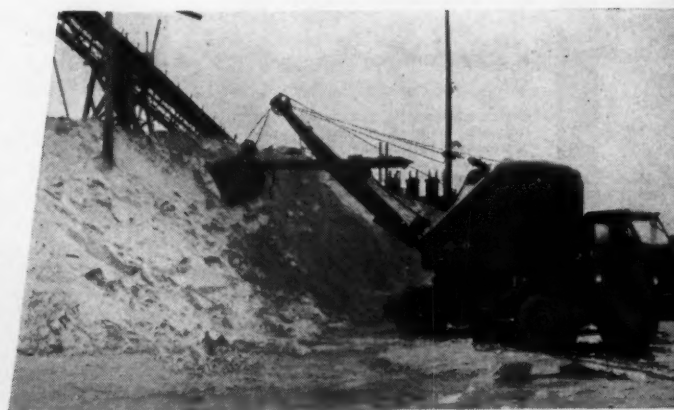
**Planetary Chain Crowd**—rapid reversing, more accurate; lasts 25 to 30 crowd cables.

**Welded Construction throughout**—rolled alloy steels make it huskier, shock-proof; no needless dead weight.

Whether your work calls for materials handling, stripping, excavation or a combination of all three, here's the ability to take them in stride. These, and P&H Added Values give you more for your excavator dollars. Investigate.



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## Operating Trends

(Continued from page 90)

same belt conveyor. Sand and stone discharge into a revolving screen with 2-in. openings on the upper half and 2½-in. openings on the lower half. Oversize drops into an Austin-Western gyratory crusher, stone passing the 2½-in. openings drops to another Austin-Western gyratory crusher, and the product passing the 2-in. screen is conveyed by a belt conveyor to the main plant.

Crusher throughs are sent by another belt conveyor to a revolving screen with 2-in. openings, oversize returning to the second gyratory crusher and throughs going to the belt feeding the main plant. At the top of the plant, the product discharges into a conical screen with ¾-in. openings, oversize going to a

bin and throughs going to a trommel screen with ½-in. openings. Throughs from this screen are laundered to a Link-Belt sand cone where concrete sand is recovered. Overflow from the cone classifier is laundered to a sand drag where masons' sand is collected. Oversize from the second trommel screen is sent to a double-deck Tyler screen with ¼- and ½-in. openings, oversize and the product retained on the lower deck going to separate bins as ¼- to ¾-in. stone and pea gravel. The fines passing the lower deck go to the launder feeding the cone classifier.

The combination of stone and sand through the same plant was started early in 1946. Two trucks of sand to three of stone has been found to be the best proportion of feed to the plant, to produce the desired concrete aggregates.

## Aggregates—Agstone

**R**OAD STONE, concrete aggregates, rip rap and agricultural limestone are produced by Dubuque Stone Products Co., Dubuque, Iowa, at a plant immediately adjacent to the city limits. Drilling of the 220-ft. face is by contract and, due to the proximity to the built-up area, only three holes are shot at once.

Rip rap, produced in rather large quantities for shore protection and as protection from railroad washouts, is loaded to trucks in the quarry for delivery, while the balance of the stone is loaded to trucks for transportation to the main plant. The trucks discharge into a 30-in. Traylor gyratory crusher; then the stone is sized through two 5- x 30-ft. revolving screens, a double-deck Tyrock vibrating screen and a triple-deck Niagara vibrating screen. Secondary crushing

is handled by a 7½ Austin gyratory crusher, an Allis-Chalmers Pulverator, and a No. 3 Symons cone crusher.

Production capacity is about 20 cars of rip rap, 40 cars of road stone and concrete aggregate, and 5 to 10 cars of agricultural limestone per day. Flow sheet of this plant is shown in an accompanying sketch on page 87.

A typical small, semi-portable, crushed stone plant is operated by the Waterloo Dredging Co., Waterloo, Iowa. Stone is trucked from the quarry and dumped into a Cedarapids jaw crusher, conveyed to a double-deck Simplicity vibrating screen, and recrushed by a Gilson pulverizer. Majority of production is agstone, with some road stone and concrete aggregate also produced.

(Continued on page 106)



Gantry crane takes aggregates from stockpiles and loads bins above both plants at Ready Mix Concrete Co., Sioux City, Iowa

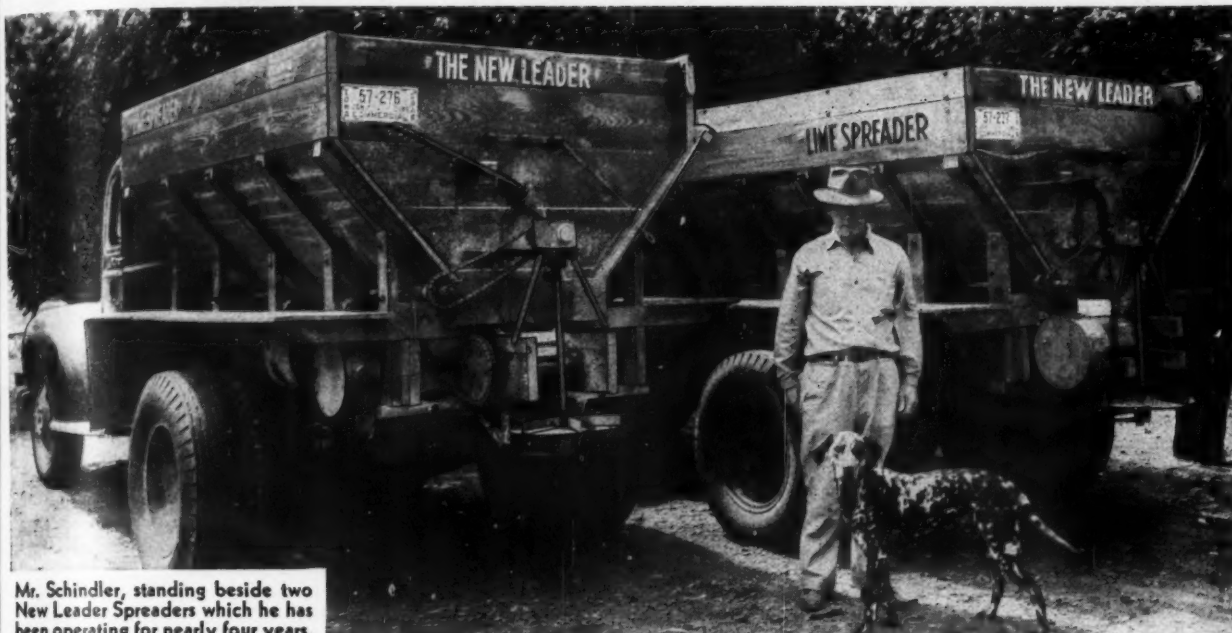
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## SPREADING PROFITS



Mr. Schindler, standing beside two New Leader Spreaders which he has been operating for nearly four years.

IT'S THE NEW LEADER SPREADER," says C. T. SCHINDLER,

limestone contractor of Linn County, Iowa.

"They really do the job."

**ALL WEATHER ADAPTABILITY KEEPS THE  
NEW LEADER BUSY MOST OF THE TIME**

Summer or winter, rain or shine, the New Leader Spreader is a versatile profit-maker. When you're not spreading aglime or marl, and you have your spreader equipped with a rock bottom attachment, you can use this unit for hauling sand, gravel, chips, and small rock for farm driveways, construction jobs, etc. Material won't freeze to sides of hopper during cold weather because hopper is made of wood. Extremely wide bottom and steep sloping sides assure steady and accurate flow of material to distributor discs even when material is wet. Designed to give years of dependable service, the latest model New Leader has an electrically welded all steel frame which mounts on any truck chassis. Hoppers are made of 1 in. flooring securely bolted to steel ribs. Ends are made of selected lumber. Entire mechanism is driven through power take-off from truck transmission. Units are available in standard sizes of 9, 11, 13 and 15 foot hopper lengths.

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Latest model New Leader Spreader equipped with twin distributor discs. Note the extremely wide bottom and steep sloping sides. This unit may be furnished with Rock Bottom Slides which permit unloading rock without running spreader mechanism.

**HIGHWAY EQUIPMENT CO., INC.**

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**MANUFACTURERS OF THE WORLD'S MOST COMPLETE LINE OF SPREADERS**



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The newly-designed latch (with stainless steel spring) gives Laughlin's unique Safety Hook a 25%-40% wider throat opening.

Don't chance accidents up above. Laughlin's Safety Hook keeps loads under control even if jolted in mid-air.

They are made of drop-forged steel, heat-treated. They're rugged. Get the details on these hooks with the improved type of latch.

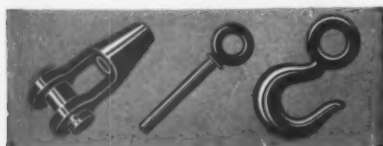
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## LAUGHLIN

THE MOST COMPLETE LINE OF DROP-FORGED WIRE ROPE AND CHAIN FITTINGS



(Continued from page 104)

There are numerous small agricultural limestone plants in Iowa, many of them working a soft deposit that requires little, if any, blasting. A complete story on one of these operations appeared in the April, 1946, issue of *Rock Products*, on page 95, describing the Schield Soft Limestone Co. at Waverly, Iowa. The stone is, in some instances, soft enough to be crushed with the fingers, yet contains a high  $\text{CaCO}_3$  content, ideally suited for agstone.

Although this article is concerned primarily with construction aggregates, description of the quarry and plant operated by W. J. Best at Aplington, known as the Best Limestone Co., is included herewith as typical of the majority of the small agstone plants.

Overburden, averaging 4- to 8-ft., is stripped with an Insley dragline with a  $\frac{3}{4}$ -cu. yd. Sargent bucket. Below the overburden is a stratum of soft, brownish limestone averaging from 4- to 12-ft. in thickness. This deposit can be reclaimed by a shovel with no blasting. Below this layer is a seam of harder stone about 20 ft. thick that requires preliminary breakage before recovery. Gardner-Denver jack hammers drill holes about 8 ft. deep, spaced at 6-ft. centers, that are loaded with from 2 to 4 lbs. of 60 percent dynamite per hole. About 15 tons of stone per hole is obtained per shot.

Stone is loaded to trucks by the same dragline and carried to the plant. Trucks back up a ramp and discharge into a 7- x 8-ft. Triangle Engineering Co. apron feeder governing the flow to a 3- x 8-ft. double-deck Simplicity screen with  $1\frac{1}{2}$ - and  $\frac{1}{4}$ -in. square openings on the two decks, respectively. The product retained on both decks drops into a No. 40 Williams slugger-type hammermill. The product passing the lower deck of the screen and the crusher throughs drop to a 36-in. belt conveyor, 26-ft. centers, that feeds a hopper above an 18-in. belt conveyor, 96-ft. centers. The latter conveyor transports the finished product to an 800-ton capacity silo, with three manually-operated discharge gates for truck loading.

One of the few shaft-mine operations, and the only one in Iowa, that produces road stone and agstone, is the operation of the Fort Dodge Limestone Co., at Fort Dodge. The stratum worked is a 53-ft. layer of high calcium stone, 120 ft. below the surface. Stone is conveyed to the surface in two balanced mine cages and dumped into a No. 3030 New Holland double-impeller crusher, a recent installation. Stone is sized over a double deck 3- x 8-ft. Universal vibrating screen.

Concrete Materials and Construction Co. is operating two crushed stone plants at LeGrand, Iowa. At one plant, stone is dumped from

trucks into a 20-in. Traylor Bulldog crusher and then taken to a revolving screen by bucket elevator. Oversize is chuted to a Cedarapids jaw crusher or to a No. 5 Allis-Chalmers gyratory crusher, then returned by way of the bucket elevator to the screen in closed circuit. The revolving screen, with 1 $\frac{1}{2}$ -in. openings, is equipped with a jacket with  $\frac{3}{16}$ -in. openings, and the minus  $\frac{3}{16}$ -in. stone drops into bins as agstone. The product between  $\frac{3}{16}$ - and  $\frac{1}{2}$ -in. is sent to two single-deck Universal vibrating screens with  $\frac{3}{16}$ -in. openings, and the throughs also go to the agstone bin. Oversize is placed in bins as road stone. Oversize from the rotary screen is recrushed in a No. 40 Williams hammermill and a Sturtevant ringroll crusher. Capacity of this plant is about 100 t.p.h. with agstone representing about 40 percent of production.

The second plant at LeGrand has a production capacity of about 180 t.p.h., 65 percent of which is agstone. Stone is taken from the quarry by mine cars and cable-hoist, and dumped into a No. 11 Allis-Chalmers gyratory crusher. A bucket elevator conveys the crusher throughs to a revolving screen for preliminary sizing. This screen has 1- and 4-in. openings. The minus 1-in. stone is elevated for secondary screening. The 1- to 4-in. stone drops into a 48-in. Gruendler pulverizer, crusher throughs being elevated by the same bucket elevator that feeds the secondary screens. Plus 4-in. stone is split to two No. 6 Allis-Chalmers gyratory crushers, the product returning to the screen by the same bucket elevator. Stone passing the revolving screen is sized on six single-deck 3- x 8-ft. Simplicity screens. Throughs discharge to the agstone bins, and oversize to the road stone bins.

To increase the production of agstone, stone can be taken from the bins and sent to two No. 2 Universal pulverizers by belt conveyor. The fines are taken by drag belt and bucket elevator to steel storage bins.

Douds Quarries Co., Douds, Iowa, produces about 50 percent agricultural limestone and the balance concrete aggregate and road stone. An auxiliary plant was set up to produce more agstone when the demand warranted, and the operation is flexible to permit production of a greater percentage of construction aggregate when desired. This is a mining operation, and primary crushing is done at the mouth of the mine. The mine has a 25-ft. ceiling, and natural cleavage planes result in a smooth floor and ceiling. It is developed by the conventional room-and-pillar system, with rooms and pillars each between 35 and 45 feet wide. Drift holes are drilled with two No. 79 Gardner-Denver drifters, using 1-in. Timken detachable steel drill bits. Four drift

(Continued on page 108)

# THE *New* INTERMEDIATE CONE CRUSHER

FINE CRUSHING - LARGE CAPACITY

COMPACT DESIGN - PORTABILITY



If it is a re-crushing job requiring an auxiliary crusher to supplement present fine crushing operations or if normal reduction crushing demands are within the range of an Intermediate Cone, here is a crusher that will deliver big capacity of fine product at low crushing cost. The Intermediate Cone has the same inherent features, and embodies the same basic principles of crushing which have made the Symons Cone foremost in the fine reduction crushing field. Compact in design and light in weight this crusher is especially adapted for portable and semi-portable plants.

Write us about your fine crushing needs. Perhaps an Intermediate Cone will exactly meet the requirements.

- ANTI-FRICTION BEARINGS ON COUNTERSHAFT.
- STEEL GEAR AND PINION.
- SIMPLE, POSITIVE LOCKING DEVICE FOR BOWL.
- MANGANESE STEEL CRUSHING MEMBERS.
- SELF-TIGHTENING MANTLE AND BOWL LINER.
- SPRING PROTECTION AGAINST TRAMP IRON.
- SETTING AUTOMATICALLY RETURNS TO NORMAL AFTER PASSAGE OF TRAMP IRON.
- POSITIVE CIRCULATING PRESSURE SYSTEM OF LUBRICATION.
- FEED IS EVENLY DISTRIBUTED AND AUTOMATICALLY REGULATED.

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## SYMONS CONE CRUSHERS

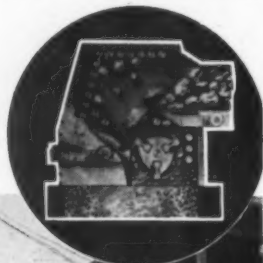
# DUAL IMPACT

## RINGS THE BELL

Greater impact action of twin impellers is a sure winner, too. That's why the New Holland 3030 breaker is a leader in stone crushing.

Dual impellers, whirling in opposite directions, reduce run-of-the-quarry stone to any desired size. Equally suitable for gravel or quarry operation, the New Holland 3030 produces 75 to 150 tons per hour . . . does it on 75 to 150 h.p. Holds oversize to a small percentage. Fits any conventional closed circuit plant.

Write Dept. A-10 for full details today.



New Holland Model 3030 in action at Napoleon Limestone Co., Napoleon, O.



**NEW HOLLAND  
MANUFACTURING COMPANY**

MOONTVILLE, PA. PENNSYLVANIA

## Operating Trends

(Continued from page 106)

holes are drilled in the upper 9 ft. of the room at angles varying from 20 to 80 deg. from the horizontal and to a depth of from 12 to 15 ft. Loaded with 60 percent Trojan dynamite, each shot brings down about one ton of stone to one pound of dynamite. After the upper section has been shot, vertical holes are drilled by No. 55 Gardner-Denver jack hammers to a depth of three ft., leaving a bench of 12 to 13 ft. above the floor. After the second section has been shot, the lower section is drilled with vertical holes, loaded and shot. The yield from the second section is about 1½ to 2 ton per lb. of dynamite, and the third section gives about 2 to 3 ton per lb.

Stone is loaded to trucks by a Model 450 Marion electric shovel with a 1¼-cu. yd. bucket, and hauled to the primary crusher. The trucks dump into a 3½- x 10-ft. reciprocating feeder to a 30- x 36-in. McLanahan single-roll crusher. Crusher throughs drop to a 24-in. Barber-Greene belt conveyor, 315-ft. centers, for delivery to the plant. The conveyor discharges to a 4- x 8-ft. double-deck Tyler Niagara vibrating screen with 1- and 3-in. square openings on the two decks, respectively. Oversize, above 3 in., drops to a pan feeder that feeds a Gruendler hammermill; the stone between 1 and 3 in. goes to a 22- x 36-in. McLanahan double-roll crusher; and the minus 1 in. drops into the boot of a bucket elevator which also handles the output of the crushers.

Discharge from the bucket elevator is to a 4- x 8-ft. double-deck Tyrock screen with 1- and ½-in. square openings on the two decks, respectively. Oversize returns to the double-rolls; the ½- to 1-in. stone is sent to a bin; and the throughs are fed over a 4- x 8-ft. single-deck Tyler Niagara vibrating screen with ¼-in. square openings. Throughs drop into a bin, while the oversize is sent to a separate bin. Discharge from the decks of both screens may be diverted to any of the four bins when a special blend is desired.

To increase agstone production, the discharge from the screens is conveyed to an outside surge bin supplying stone to an auxiliary plant. The feed from the surge bin is to an 18-in. belt conveyor, 40-ft. centers, discharging to an 18- x 36-in. Cedarapids roll crusher. Crusher throughs are carried by another belt conveyor to a small hammermill to break up caked stone. This mill discharges to an 18-in. belt conveyor, 50-ft. centers, conveying the stone to a 4- x 8-ft. double-deck Niagara screen with ¾- and ¼-in. square openings on the two decks, respectively. Oversize is conveyed to a 18- x 36-in. Austin Western double-roll crusher and re-crushed stone is returned to the first belt in this auxiliary setup. The prod-

uct retained on the lower deck is loaded into trucks by a belt conveyor or can be returned to the Austin Western roll crusher over another belt conveyor for further reduction. The throughs from the screen drop into a small truck-loading bin.

## Crushing and Screening Practices

One of the newer, small stone plants in Iowa is one operated by the Farmington Gravel Co. at Bonaparte. A 30-ft. layer of high calcium limestone is drilled by jack hammers. An Insley crane with a ¾-cu. yd. bucket loads trucks for the haul to the plant. Trucks dump onto a 36- x 72-in. Cedarapids plate feeder discharging the stone into a 15- x 24-in. Universal jaw crusher. The crusher product is put over a 2- x 3-ft. single-deck Simplicity screen with ¾-in. square openings, by an 18-in. belt conveyor. Oversize is re-crushed by a Gruendler hammermill and this product joins the product passing the screen on a 24-in. belt conveyor, putting the stone over a 4- x 12-ft. single-deck, Tyrock screen, with ¼-in. square openings on the upper 6 ft. and 1-in. square openings on the lower 6 ft. of the screen. Stone passing the ¼-in. deck discharges into an agstone bin; stone passing the 1-in. deck into a road stone bin; and oversize into another bin. The oversize, about 3 percent of production, can be returned to the primary crusher by truck when the bin is full. Production capacity is about 200 ton per day.

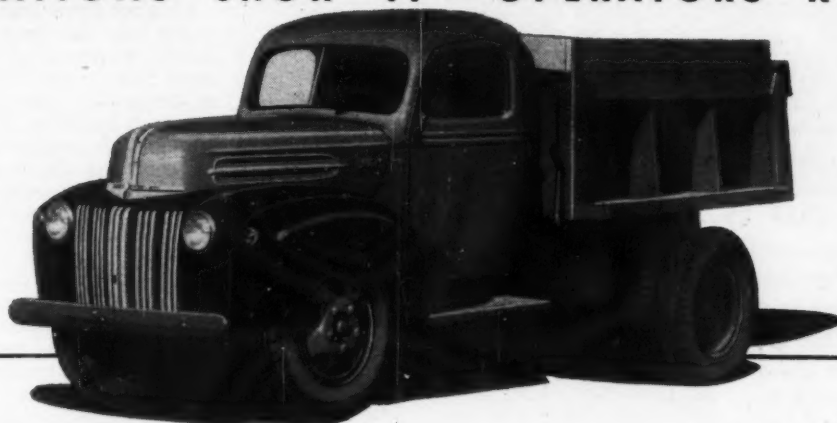
At Linwood, Iowa, Linwood Stone Products Co., Inc., is producing road stone and agricultural limestone in about equal proportions. Recent installation of crushers in the quarry and a belt conveyor system of transportation, as part of an overall modernization program, have resulted in an increase in production from 10,000 to 25,000 tons per month.

Stone is carried by 6-cu. yd. Koehring Dumpers from the quarry face to a feeder that feeds the stone into a 40- x 42-in. Superior jaw crusher. Crusher throughs are carried by belt conveyor to the secondary crusher, a 50- x 50-in. Dixie hammermill. The product of this mill goes to a long conveyor that discharges into a surge bin adjacent to the main plant. Purpose of the surge bin is to attain steady production in the quarry or plant, the effect being that the two operations can function independently of one another. A reciprocating feeder under the bin to a belt conveyor for transportation to a pit where it is picked up by bucket elevator are the means of delivery to the main plant. Stone is sized by a revolving screen and any further crushing is done by a Williams hammermill.

(Continued on page 110)



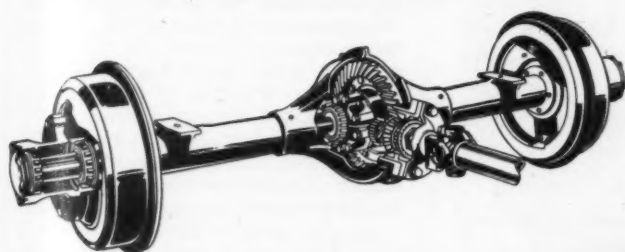
REGISTRATIONS SHOW IT — OPERATORS KNOW IT!



Dump Body by  
MARION METAL  
PRODUCTS CO.,  
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# "FORD TRUCKS LAST LONGER!"

**One big reason—  
FORD AXLES STAND UP!**



Ford Truck axle shafts carry no weight load, because ALL Ford Trucks have  $\frac{3}{4}$ -floating or full-floating axles. All weight stresses are carried on the axle housing—none on the shafts—minimizing shaft breakage. Driving pinion is straddle-mounted on 3 large roller bearings, maintaining positive mesh with ring gear—no destructive springing away under stress. Differentials have 4 sturdy pinions, even in light duty chassis, spreading the load and strain.



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mum life. More than 50 such long-life features contribute to Ford Truck endurance . . . and that endurance is proved by the fact that 7 out of 11 of all Ford Trucks built since 1928 are still in use. See your Ford Dealer!

## FORD TRUCKS

MORE FORD TRUCKS IN USE TODAY THAN ANY OTHER MAKE

## Welded Manganese Steel Dipper "Thrives" on Tough Limestone In Underground Quarry . . .

In the underground quarry of the Louisville Crushed Stone Co., 150 to 160 tons of shot limestone per hour are removed by a Lorain 82 shovel, equipped with a 2 yd. Amsco "stream-line" welded dipper, as shown in picture R-784. The material is loaded, as shown in A-517, into three trucks, which haul it to a feeder serving a 28" x 36" jaw crusher.

In this picture also the large chunks of limestone among the material handled are visible. Plenty of heavy impacts as well as severe abrasion are the constant portion of the dipper on this job.



R-784. The Amsco all-manganese steel "stream-line" welded dipper as used on Louisville's shovel.

This kind of service naturally calls for a manganese steel dipper, as no other metal would stand up long under the punishment received. Here continuous operation is important, and out time for dipper repairs would cut sharply into output and profits.

Austenitic manganese steel is literally at its best where both shocks and abrasion are encountered. Impacts which would soon fracture or wear out ordinary steel serve only to work-harden "the toughest steel known," in-

creasing its resistance to abrasion to a maximum degree. As the work-hardened surface of manganese steel is self-renewing,




A-517. 2-yd. Amsco dipper on Lorain 82 loading shot limestone.

Amsco dippers stand up for long periods without the need of interrupting operation for repairs.

On many rugged jobs, where continuous pounding, heavy loads and abrasion would quickly destroy ordinary buckets, you'll find Amsco dippers. Amsco advanced dipper design adds substantially to the economy of the metal.

Write for Bulletins 641-D and 641-S on Amsco dippers and power shovel parts.

**Joliette Steel Limited, Joliette, Quebec, owned by American Brake Shoe Company, produces and sells Amsco Manganese Steel Castings in Canada.**



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**AMERICAN MANGANESE STEEL DIVISION**  
CHICAGO HEIGHTS • ILLINOIS



(Continued from page 108)

Another Iowa crushed stone plant which has increased production and provided a more uniform load to the main plant is the River Products Co., at Coralville. The primary crusher has been installed in the quarry and haulage has been changed from locomotive to truck. Stone is hauled to the primary crusher in 15-ton capacity Easton trailers. The trailers discharge to a plate feeder that regulates the flow to a Worthington jaw crusher. Crusher throughs, conveyed by a 30-in. belt conveyor to the main plant, discharge into a surge hopper with split feed to two Universal jaw crushers. Both crushers discharge to the boot of a bucket elevator carrying the stone to a double-deck Simplicity vibrating screen with 1- and 3/16-in. square openings on the two decks, respectively. Oversize is sent by belt conveyor to a Universal roll crusher, crusher throughs returning to the bucket elevator for return to the screen in closed circuit.

Stone retained on the 3/16-in. deck is discharged into a road stone bin, while the product passing the lower deck (agstone) discharges into another bin. When greater production of agstone is desired, the stone retained on the lower deck is chuted to a Universal hammermill. Crusher throughs (agstone) are conveyed to an auxiliary bin for truck loading.

With the new haulage system and installation of the primary crusher in the quarry, this company has stepped up production from 65,000 tons in 1938 to 93,000 tons in 1945.

### Ready Mixed Concrete

IOWA SPECIFICATIONS provide for ready mixed concrete for construction work, either "central plant-mixed concrete or central plant proportioned truck-mixed concrete." There are several large ready mixed concrete plants in Iowa. The plant owned and operated by C. W. Shirey, at Waterloo, is representative of the better equipped operations. Long associated with the industry and at present the president of the National Ready Mixed Concrete Association, Mr. Shirey started his first plant with bins, an old paving mixer, and dump trucks. He now operates a modern batching plant equipped for winter operation and with bulk cement equipment, and a fleet of 13 transit mixers.

Sand and gravel aggregates are trucked in from a company-owned plant and shipped in by rail from other sources. The plant has a 6-compartment Blaw-Knox bin served by a bucket elevator, feed to the separate compartments being governed by swivel chute and a selector wheel at ground level. Bulk cement capacity is 330 cu. yd. in a 3-compartment Butler bin.

Aggregates are weighed by a four-beam scale and cement is weighed on a separate scale. Thirteen 2- and 3-

cu. yd. high-discharge mixers are used, seven Blaw-Knox, five Rex, and one Jaeger. Capacity of the plant, on a year-round basis, is 75-cu. yd. per day.

Two new plants have been placed in operation in Des Moines, one operated by Keefner Concrete and Lumber Co., long identified with the industry, and the other by the Crown Concrete Co., affiliated with the Coon Valley Gravel Co. and Douds Quarries Co. An article on the Crown Concrete Co. operation was published in the July, 1946, issue of *ROCK PRODUCTS*. Keefner Concrete and Lumber Co. erected its new plant in 1946, which is described in more detail elsewhere in this issue.

At Sioux City, the Ready Mix Concrete Co. has a ready-mixed concrete operation located in the yard formerly used by a coal company. The Link-Belt gantry crane, formerly used by the coal company, was left in place and now moves aggregates from a large stockpile area to the ready mixed concrete operations. Prior to 1945, only one plant was in operation, consisting of a two-compartment, 60-cu. yd. capacity bin, a 2-cu. yd. Ransome central mixer, and a 250-gal. water tank. Bagged cement is delivered from a storage shed to the plant over a belt conveyor. In 1945, a new plant was erected, consisting of a 4-compartment, 120-cu. yd. capacity Johnson bin, equipped for bulk cement. The new plant has a pozzolith admixture dispensing system as well as a heating system for aggregates and water. Concrete is centrally-mixed by a 1½-cu. yd. Ransome mixer. A fleet of eight transit mixers (agitators) are in service, four Jaeger and four Rex, as well as four bath-tub type hauling units.

## Highway Specifications

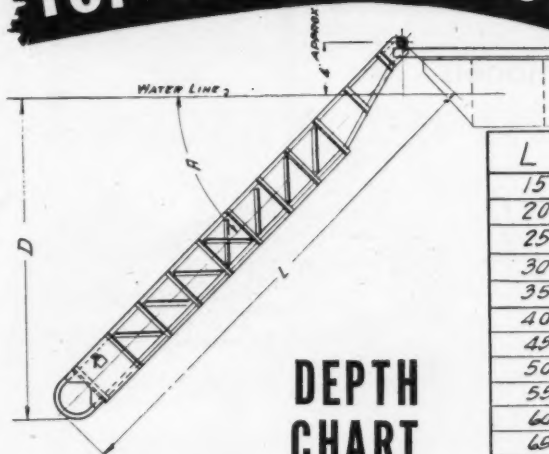
(Continued from page 84)

wear of 8 or less. Gravel shall not have a percentage of wear greater than 20 when tested in accordance with the A.A.S.H.O. "Method of Testing Abrasion of Gravel" Method T-4, Grading B.

Mixtures of crushed stone and gravel pebbles may be used if approved by the Engineer provided the composition of the mixture is uniform and the sieve analysis of the crushed stone and gravel, after being combined, meets the required grading for coarse aggregate.

Class 3—This class shall consist of gravel pebbles combined with fine aggregate in the form of pit-run or unscreened gravel, or any combination of such unscreened gravel with Class 1 or Class 2 coarse aggregate. The pit-run or unscreened gravel to be used in conjunction with the two classes mentioned shall contain not less than 60 percent of particles that will pass a No. 4 sieve. Pit-run or unscreened gravel to be used without the addition of coarse aggregate shall contain not less than 45 percent of

# Dredge Lower Depths for Higher Profits....



## DEPTH CHART

L	D WHEN A = 45°	D WHEN A = 60°
15	6.5	9
20	10	13
25	13.5	17.5
30	17	22
35	20.5	26
40	24	30.5
45	27.5	35
50	31	39
55	35	43.5
60	38.5	48
65	42	52
70	45.5	56.5
75	49	61

In many sand and gravel deposits, the depth of dredging possible—using plain suction nozzle alone—has been reached and worked. As an article in a trade journal reaching sand and gravel producers, recently pointed out:

"Some change in machinery and methods of excavating will be necessary to operate at a profit in the competition of post war markets."

Another adverse factor, always present in plain suction pipe dredging, is the uncertainty of flow of solids into the nozzle and the clog-

ging of the system by boulders, lumps and clay and debris.

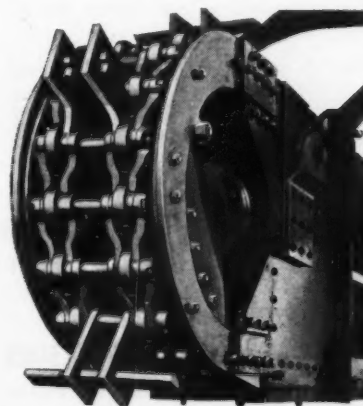
The Eagle "Swintek" Dredging Ladder readily solves both these problems, and has made possible profitable dredging of sand and gravel at depths way beyond that attainable with plain suction pipes. (See depth chart.)

The digging position of the Eagle "Swintek" Ladder is adjustable in relation to the pond water level. The maximum digging depth for a given operation is determined by the length of ladder employed. The digging depths of ladders of various lengths are shown in the chart. Best deposits usually lie at lower levels.

The cutters on a "Swintek" effectively loosen and tear out the material, insuring the feeding of a maximum proportion of solids into the pipe line. The traveling chain is a positive barrier against oversized solids entering the nozzle and clogging the pipe line, and eliminates costly operating delays for clearing clogged lines and pumps and untimely breakage.

Eagle "Swintek" Dredging Ladders have increased production as much as 400% (an actual case), and they substantially increase profits.

Write today for details, and a copy of new Catalog No. 745.



The cutters loosen deposit and insure uniform feed of solids; at the same time carrying oversize up the ladder as the endless chain passes over the nozzle, where it acts as a screen.

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137 Holcomb Avenue  
Des Moines, Iowa

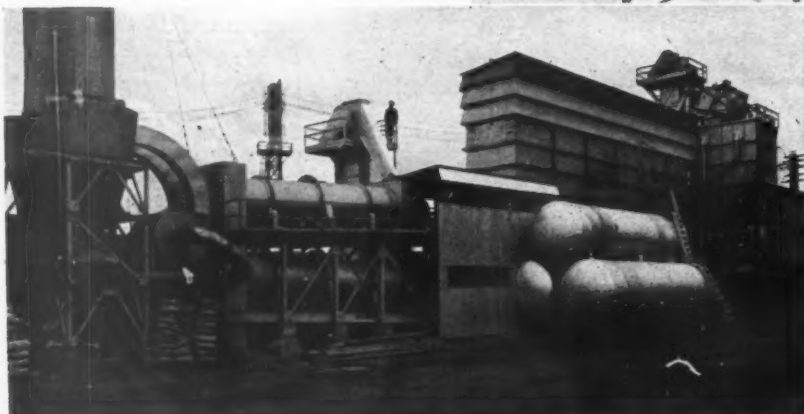
**EAGLE** Specialized Sand and Gravel Equipment  
"SWINTEK" DREDGE LADDERS — SCREW WASHERS  
LOG WASHERS — DEHYDRATORS — SAND TANKS  
CLASSIFIERS — REVOLVING SCREENS

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portable plants →  
to the largest  
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This complete traveling mixer and paver—self-contained and self-propelled—mixes, spreads and lays any type of mixed-in-place bituminous material to any width, thickness and crown condition. Write for Bulletin MP-46.

Dependable performance—under a wide variety of operating conditions, is engineered and built into every H and B Asphalt Plant. As America's first builders of bituminous mixing machinery, Hetherington & Berner take pride in building equipment that will do a good job and prove a good investment for its owner. Every H & B plant is completely erected and checked at our factory before shipment.

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No. 773

(Continued from page 111)

particles that will pass a No. 4 sieve. The portion of unscreened gravel passing a No. 4 sieve shall conform to the requirements for fine aggregate.

### Ready Mixed Concrete

The Highway Department of Iowa allows the use of ready mixed concrete in lieu of concrete mixed at the site of the work. Either central plant-mixed concrete or central plant proportioned truck-mixed concrete is accepted. Unless special permission is granted, mixing time must not exceed one hour, and the producer supplying concrete must have sufficient plant capacity and transporting apparatus to insure continuous delivery at the rate required.

Proportions specified for the various mixes are as follows:

(Basic Absolute Volumes of Material Per Unit Volume of Concrete)			
Mix No.	Cement (min.)	Water (App.)	
1	0.115873	0.169510	
2	0.121544	0.177806	
3	0.126459	0.184906	
4	0.131562	0.192462	
Mix No.	Fine Agg. (App.)	Coarse Agg. (App.)	
1	0.235824	0.478793	
2	0.280260	0.420390	
3	0.309845	0.378700	
4	0.337988	0.337988	

### Crushed Stone Meeting

(Continued from page 77)

who is seriously ill; BATTLE RODES, Nashville, Tenn., succeeds his father, H. E. RODES, who is merely taking life easier.

### Registration

Directors present were: G. A. Austin, chairman, Decatur, Ga.; Wm. M. Andrews, New Castle, Penn.; H. H. Brandon, Melvin, Ohio; J. E. Bryan, Raleigh, N. C.; J. Reid Callanan, South Bethlehem, N. Y.; W. N. Carter, Joliet, Ill.; C. T. Cooke, Swampscott, Mass.; F. O. Earnshaw, Youngstown, Ohio; O. M. Graves, Easton, Penn.; R. G. L. Harstone, Hamilton, Ont., Canada; J. C. Lauber, Minneapolis, Minn.; M. E. McLean, East St. Louis, Ill.; V. C. Morgan, Louisville, Ky.; Russell Rarey, Columbus, Ohio; W. R. Sanborn, Kankakee, Ill.; James Savage, Buffalo, N. Y.; F. W. Schmidt, Jr., Morristown, N. J.; O. M. Stull, Buchanan, Va.; Stirling Tomkins, New York, N. Y.; W. H. Wallace, Bay Port, Mich.; W. F. Wise, Dallas, Tex.; L. Worthen, New Haven, Conn.; James Eells, Cleveland, Ohio; S. P. Moore, Cedar Rapids, Ia.; Milo A. Nice, Wilmington, Del.; L. W. Shugs, Schenectady, N. Y.; J. B. Terbell, New York City; John C. Gall, Washington, D. C.; and Harold W. Williams, Boston, Mass.

## Agricultural Limestone Division

The board of directors of the Agricultural Division of the National Crushed Stone Association, meeting the following day, heard reports by its managing director, HENRY A. HUSCHKE, and the secretary-treasurer, J. R. BOYD. The latter's report covered much the same ground as his report to the National Association's board. Mr. Hushke's report referred to his promotional work, which all agreed had made remarkable progress in a very short time. The membership is steadily increasing; in January it was 164, and on July 15, there were 186, including probably about 65 percent of the nation's tonnage. Nevertheless, a great many producers are still outside the fold, and every effort will be made to acquaint them with what the organization has already done and is doing for the industry. In this connection, a committee, of which Phil Heim was chairman, drew up the following statement of policy:

### Statement of Policy

"It is the inevitable result of farming in the humid areas of this nation that there is dissolved and leached out of the soil certain chemical elements that are essential to the economical production of wholesome and nutritious food and feed crops. This directly affects the health and welfare of the nation.

"The mineral elements which suffer the greatest losses from the dissolving and leaching action of rain water, an action over which man has little or no control, are the basic or alkaline elements, notably calcium and magnesium, the chief components of limestone and dolomite.

"The effect of these losses is an unbalanced soil, a soil that does not produce at an economical rate and whose crops are lacking in the needed amounts of minerals to maintain the people and animals of this nation in a reasonably good state of health. This fact is well exemplified by the large number of young men who were unacceptable for military service due to health defects, the figure running as high as 70 percent rejections in areas where the mineral content of the soil is very low.

"Technicians who are best informed on this subject, namely the agronomists and soil chemists of our state colleges and experiment stations, have determined that over 50 million tons of agricultural limestone are needed annually to replace the yearly loss of calcium and magnesium and to keep our soils in a reasonable productive state. Our present rate of consumption is less than half that amount.

"From the standpoint of monetary investment it is highly profitable to apply agricultural limestone to the soil. However, a considerable period of time is required before the full return is realized. This fact makes

(Continued on page 114)



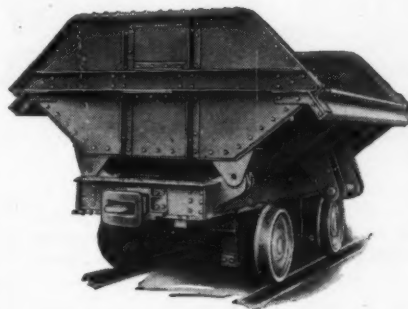
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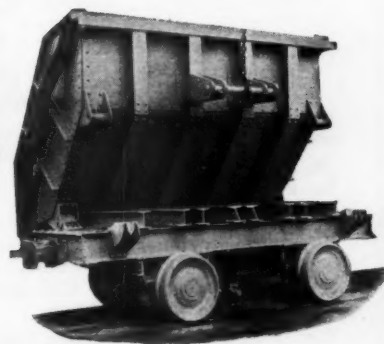
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THIS compact Lever Arm Rehandler Bucket of normal proportions has ample closing power to fill to capacity in compact materials, and is so designed that the reeving can be adjusted to obtain maximum speed with capacity grabs in loose materials. We have reduced the "height open dimension" thus requiring minimum headroom, enabling you to pile higher and to discharge into higher hoppers. Lighter weight alloy construction provides more pay load (scoop contents) less bucket dead weight. To see this bucket in all detail write for bulletin 403.



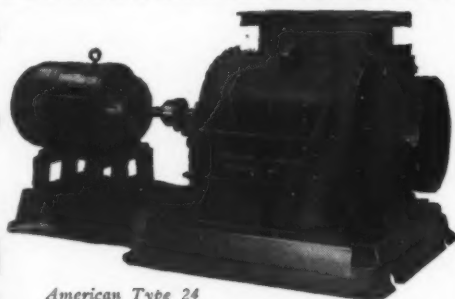
● Write for Booklet 403

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### Your Crushing Problems ARE NOT TOO TOUGH for AMERICAN CRUSHERS



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No matter how tough your crushing problems are . . . they're not too tough for Americans. Americans are built to withstand severe, continuous operation and at the same time give high tonnage production of uniform sizes, under even the toughest of conditions.

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the investment not too attractive, even to many farmers who have the money available.

"The problem of replacing the lost calcium and magnesium further is aggravated by the fact that about 40 percent of the farms in the United States are operated by tenants who, for the most part, do not have the interest in the future productivity of the land that an owner has and, therefore, do not invest in limestone.

"Great strides have been made since 1938 through the programs of the Agricultural Adjustment Agency (now the Field Service Branch of the Production and Marketing Administration) toward solving the problem of getting back into our soils the calcium and magnesium that have been lost through cropping and leaching. But the task is only half done. It is to the interest of the entire citizenry of this nation that these efforts be continued and expanded.

"Obviously, to attain the goal of 50 million tons per year is no small job. It is one that will require for an indeterminate number of years, the complete cooperation of government and industry. The fullest efforts of both are required to make farmers mindful of the necessity of more than doubling their soil-liming activities. This cannot be done without the activating influence of the Conservation Materials Program of the Field Service Branch. Nor can it be done unless the farmers of this nation are convinced that their own welfare, as well as that of the nation, is at stake.

"Therefore, in the light of the foregoing, it is the declared policy of the Agricultural Limestone Division of the National Crushed Stone Association, THAT:

"1. In the interest of the national welfare and the conservation of our soils, the Agricultural Limestone Division will actively and vigorously support a continuance of Federal aid to finance government programs designed to restore to an optimum level the calcium and magnesium content of our soils.

"2. The Agricultural Limestone Division will continue to an even greater extent to assist in securing for the farmer and the nation as a whole, a well balanced soil conservation program. To this end the Division proposes to consult, from time to time as may be appropriate and feasible, with the Federal, State and local agencies concerned.

"3. Federal aid will be supported until this industry through its own augmented efforts in merchandising, promoting and financing, is able to sell through the usual commercial channels the tonnage of agricultural limestone recommended by our well informed agronomists and soil chemists.

"For the foregoing purposes the Division will work energetically and wholeheartedly."

The board received and accepted



with regret the resignation of E. J. KRAUSE, St. Louis, Mo., and then proceeded to elect him an honorary member of the board. As active member the board elected HORACE C. KRAUSE, son.

### Registration

S. P. MOORE, Cedar Rapids, Ia., chairman; H. E. Battin, Jr., South Bethlehem, N. Y.; S. B. Downing, Jr., Lexington, Ky.; A. B. Rodes, Nashville, Tenn.; O. M. Stull, Buchanan, Va.; H. A. Clark, Chicago, Ill.; James Eells, Cleveland, Ohio; E. E. Haapala, Zumbrota, Minn.; W. R. Sanborn, Kankakee, Ill.; A. K. Hausmann, Cleveland, Ohio; P. E. Heim, Youngstown, Ohio; W. E. Hewitt, East St. Louis, Ill.; F. W. Mumma, St. Louis, Mo.; R. M. Seifried, Findlay, Ohio; W. M. Palmer, Ocala, Fla.; E. V. Scott, Dallas, Tex.; C. M. Sims, Gaffney, S. C.; O. M. Graves, Easton, Penn.

### Sand and Gravel Meeting

(Continued from page 66)

geles rattler test. Other investigations concern the effects of air-entraining agents on concrete, including any possible effect of the agent itself regardless of air entrainment. Effect of sand grading on the resistance of concrete to freezing and thawing is another study. Special gradings for bituminous pavement aggregates came in for some criticism, since there is a tendency to specify impossible combinations.

The subject of minimum tolerances within commercial practices in screening was discussed by Mr. Walker. The need for plant research in this field has been emphasized by Rock Products on several occasions. At Mr. Walker's suggestion the board voted unanimously to promote such an investigation, under the auspices, if possible of the U. S. Bureau of Mines.

Another matter the board took action on was approval of the establishment of a short course of instruction on the properties and uses of aggregate in concrete, to be held for the technical employees of the industry, at the University of Maryland, for one week, beginning November 18.

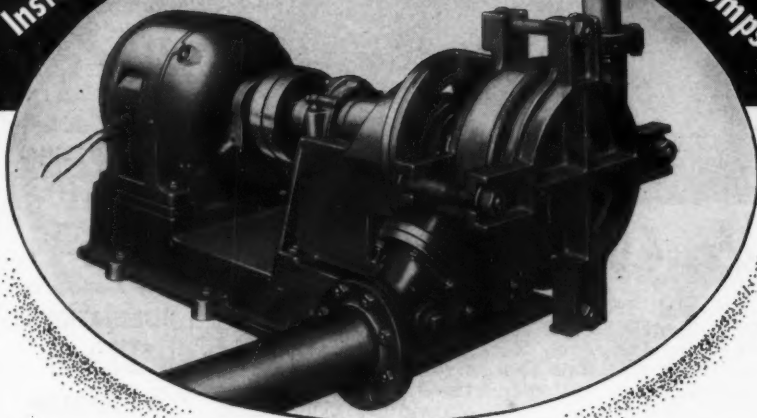
### Board Changes—Registration

R. N. COOLIDGE, Nashville, Tenn., president and chairman of the board of directors of the National Sand and Gravel Association, presided. The resignation of E. J. Goodpastor, San Francisco, was accepted and the board elected Carl R. Olson, Oakland, Calif., to fill the unexpired term. Mr. Goodpastor, vice-president, Pacific Coast Aggregates, Inc., is relinquishing some of his responsibilities. Mr. Olson is vice-president of the Henry J. Kaiser Co. The following list includes some guests, who are not members of the board:

V. P. Ahearn, Washington, D. C.; H. D.

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Install one of the NEW MORRIS Type "R" Slurry Pumps



- ✓ THE PUMP particularly suited to CEMENT MILL requirements.
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Representing the latest in advanced slurry pump design, the new Morris Type "R" will give you longer wear, lower operating costs, and less trouble with these features:

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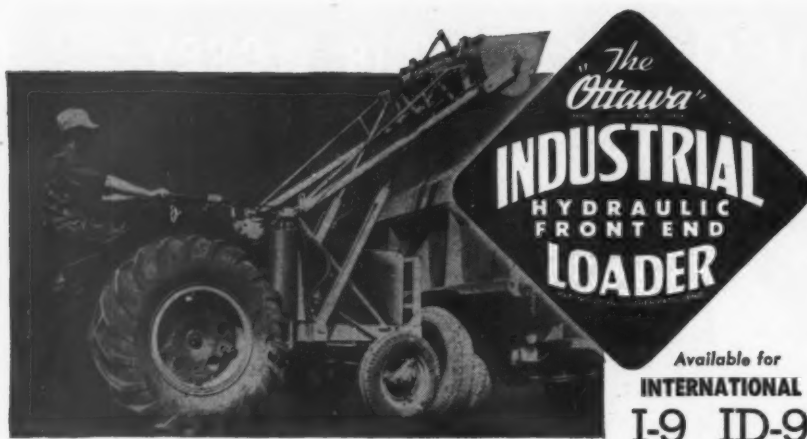
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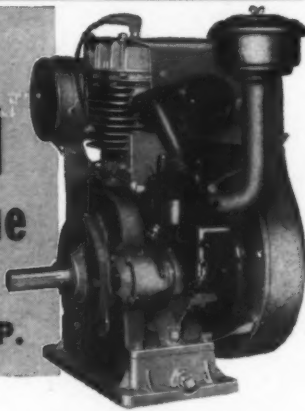
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*This* **HEAVY-DUTY**  
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*Air-Cooled-Engine*  
**IS AVAILABLE IN 4**  
**SIZES . . . 4 TO 9 H. P.**



Illustrated above is the Models AEH to AHH series of 4-cycle single cylinder Wisconsin Air-Cooled Standard Engines, to which the following specifications apply:

MODEL	AEH	AFH	AGH	AHH
Bore.....	3"	3¼"	3½"	3¾"
Stroke.....	3¼"	4"	4"	4"
Cu. in. Displ.....	23	38.2	38.5	41.3
Hp. Range.....	4-6	5-7	6-8.5	7-9
Weight.....	130 lbs.	170 lbs.	175 lbs.	180 lbs.

If your equipment calls for an engine within the above power range, it will pay you to give serious consideration to the Wisconsin line . . . noted for rugged, heavy-duty serviceability and thorough-going dependability.

In addition to the engines listed above Wisconsin 4-cycle single cylinder engines are also available in 2 to 4 hp. sizes, and V-type 4-cylinder engines can be supplied in a power range of 13 to 30 hp. Detailed data furnished on request.

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### Ready Mixed Concrete

C. W. SHIREY, Waterloo, Iowa, president and chairman of the board, presided at the meeting of the directors of the National Ready-Mixed Concrete Association. The meeting was remarkable in that only one board member was absent.

STANTON WALKER, director of engineering was the first on the program. His report covered some of the same ground already referred to above. He emphasized the necessity for the association to keep ahead of developments, because to some extent at least the reputation of the ready-mixed concrete industry as to the quality of its product is at stake. The association must therefore be a leader in concrete technology. In addition to the studies mentioned in his report to the directors of the National Sand and Gravel Association, he said investigations were in progress to determine the shrinkage between plastic and hardened concrete—the effect of the time factor.

Mr. Walker said that there is an increasing demand for control devices on transit mixers and agitators, such as revolution counters and consistency meters.

H. F. THOMSON, chairman of a committee to investigate the weaknesses in truck chassis design, reported progress. Mr. Walker called attention to the possibility that some operators may be exceeding wheel-load limits, especially with four-wheel trucks. Under the new federal aid highway law many city streets will be included in state highway systems and it may be necessary to watch wheel loads more carefully. With a dual rear axle, probably 5 to 5¼ cu. yd. is a safe load.

V. P. AHEARN, executive secretary, estimated that production of ready-mixed concrete as a whole was probably about 25 percent above the same period in 1945. Perhaps about 75 percent of this year's production is commercial or industrial, although there is a large amount of small order.

C.O.D. business in the cities. Apparently a great deal of concrete is going into maintenance and repair of commercial and industrial buildings.

There was an off-the-record discussion of the effect of O.P.A. developments on the price structure of both the sand and gravel and ready-mixed concrete industries, but since then there have been developments, which probably will make the discussion rather pointless.

### Registration

The registration list given herewith includes some guests as well as directors:

V. P. Ahearn, Washington, D. C.; W. A. Bliss, Pittsburgh, Penn.; E. K. Davison, Pittsburgh, Penn.; Joseph H. Dixey, Kitchawan, N. Y.; George C. Eady, Louisville, Ky.; Alexander Foster, Jr., Philadelphia, Penn.; Norman J. Fredericks, Detroit, Mich.; Paul Graham, Los Angeles, Calif.; C. Gray, Indianapolis, Ind.; R. K. Humphries, San Francisco, Calif.; James F. McCracken, Louisville, Ky.; William Moore, Boston, Mass.; John W. Murphy, Spokane, Wash.; Jack O'Halloran, Spring Valley, Ill.; H. F. G. Pelsue, New York City; T. E. Popplewell, Fort Worth, Tex.; Robert Porter, Towson, Md.; Nathan C. Rockwood, Chicago, Ill.; Joseph M. Scheinin, New York City; Louis C. Schilling, Miami, Fla.; John W. Shaver, Chicago, Ill.; C. W. Shirey, Waterloo, Iowa; F. P. Spratlen, Jr., Denver, Colo.; H. F. Thomson, St. Louis, Mo.; W. E. Trauffer, Chicago, Ill.; G. K. Viall, Milwaukee, Wis.; Stanton Walker, Washington, D. C.; Julius J. Warner, Cincinnati, Ohio; Ray Warren, Pittsburgh, Penn.

### Pennsylvania Agstone Meeting and Field Day

PENNSYLVANIA STONE PRODUCERS ASSOCIATION, Agricultural Limestone Division, held a board of directors' meeting and field day at Pennsylvania State College on July 16 and 17. At the board meeting, John Curtin, Sr., reported that the National Lime Association was sponsoring a post-graduate research program at five different leading State colleges. Robert M. Koch, of the Department of Agriculture, told about the A.A.A. program. Leonard Fry presented a resolution, which carried, that the Division promote a research program to determine the relative nutritive values of foods produced from soils which were rich in certain elements, versus those grown from soils in which these elements were not as abundant.

Fifty-two were present at the field day called to order by Dr. H. K. Wilson. Outstanding speakers of the college described the studies and test plots to determine better soil building practices, and the part liming had in raising the dollar value of crops. Dr. Wilson introduced Secretary H. H. Wagner of the Association and John Curtin, Sr., whom he credited with being largely responsible for making available funds necessary to erect a new Agronomy Building on Pennsylvania State College Campus.



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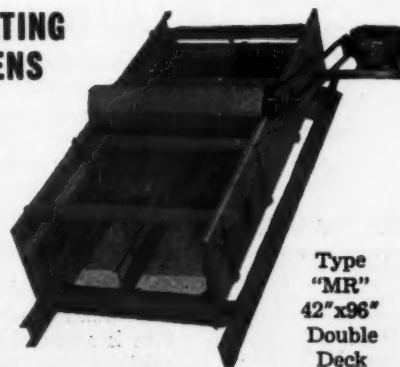
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CINCINNATI, BUFFALO, NEW YORK, BOSTON

## New Incorporations

Hartland-Verona Gravel Co., Verona, Wis., has been organized to operate a sand and gravel business, with a capital of \$50,000. Incorporators are P. W. and Esther Palmer of Edgerton, and Chester J. Niebler of Milwaukee.

Cement Engineering Co., Wilmington, Del., has been incorporated to manufacture cement, lime, etc. Capital, \$2000. Principal office, Corporation Trust Co.

Suburban Sand & Gravel Co., Inc., Kermore, Wash., has filed articles of incorporation with a capital of \$8000. Incorporators are Paul R. Grunewald, Louise Grunewald and Dennis E. Graves, all of Seattle.

Grenci & Sons, Bangor, Me., has filed a certificate of incorporation to engage in the quarrying of granite and all kinds of stone and minerals and to generally trade in granite and stone. Authorized capital stock is \$100,000 and a like amount of common consisting of 10,000 shares with par value of \$10 per share. Bruno M. Grencki of Peekskill, N. Y., is president and treasurer and he and George F. Eaton and Marjorie F. Morse comprise the board of directors.

R. A. Bergesson & Son, Inc., Woonsocket, R. I., has been organized to buy, sell, manufacture gravel and other road building materials, to operate quarries, construct roads, deal in real estate. Authorized capital, \$100,000 preferred, with 600 shares common, no par value.

International Timber Products, Inc., Seattle, Wash., has filed articles of incorporation to carry on a business of wholesaler and retailer of cement, paint, brick, stone, roofing, lumber, electrical and plumbing supplies, etc. Capital, \$30,000. Incorporators are O. D. Anderson, J. P. Hunter and Dorothy Emerson, all of Everett, Wash.

Johnson Sand & Gravel Co., Terryville, Conn., has filed certificate of organization. Subscribed capital: \$5000 in cash and 200 shares at par value of \$25 each. Officers are Sydney Cantor, president; Arthur E. Kramer, vice-president; Samuel Kramer, treasurer; and Hy L. Kramer, secretary.

Quarry Products, Inc., Topeka, Kans., has been organized to produce stone, sand and other minerals. Authorized capital, \$50,000. Incorporators are H. M. Swenderson, Brown Parker, and George E. Robinson, all of Topeka.

Arctic Trading & Transport, Inc., Seattle, Wash., has been granted articles of incorporation to carry on a sand and gravel business. Authorized capital, \$100,000. Incorporators are J. S. Robinson, S. E. Anderson, Vernon Lontz, R. M. Pagyn, and Lloyd C. Low, all of Seattle.

Missouri Valley Limestone Co., Winterset, Iowa, has been incorporated to operate limestone quarries in Pottawatomie county, Mo. Capital stock is \$100,000. Incorporators are Herman E. Snater, who is in charge of all operations, and Arling E. Smith, vice-president. The company will produce road rock and agricultural limestone.

Yourtee-Roberts Sand Co., Chester, Ill., has filed notice of entry into Arkansas, with headquarters in Helena, Ark., and has placed the value of the property to be used at \$20,000.

Arkansas Materials, Inc., Little Rock, Ark., has been granted articles of incorporation to deal in mineral, metal and ore deposits. Authorized capital, \$20,000. Incorporators are Leffel Gentry, Little Rock, resident agent, Ewing P. Pyeatt and J. T. Cone of Searcy.

Shenandoah Stone Corp., Woodstock, Va., has received a charter to engage in the mining, quarrying and marketing of stone and stone by-products. Maximum authorized capital, \$100,000. Officers are H. D. Harter, Woodstock, president; J. K. McGrath, Harrisonburg, vice-president; C. M. Moyer, Staunton, secretary; and Ruth B. Harter, Summit, N. J., treasurer.

Fredericktown Sand & Gravel Co., Morris Township, Knox County, Ohio, at Fredericktown, has been incorporated with a capital of 250 shares, no par value. Incorporators are Roy F. Price, Philip E. Guthrey and George F. Slapsaddle.

## Manufacturers' News

Worthington Pump & Machinery Corp., Harrison, N. J., has announced the appointment of L. S. Riedel as regional manager of the construction equipment division, Bronx, N. Y.; also the appointment of Steven F. Evelyn as consulting engineer of construction equipment products in Holyoke, Mass. Howard Platts succeeds Mr. Evelyn as chief engineer of the portable compressor division.

Lovejoy Flexible Coupling Co., Chicago, Ill., has acquired in entirety, the manufacture and sales of the mechanical power transmission department of Ideal Industries (formerly Ideal Commutator Dresser Co.), Sycamore, Ill.

Gar Wood Industries, Inc., New York, N. Y., has appointed John J. Palmer as manager of the Newport News, Va., plant. Mr. Palmer was formerly vice-president of the Horace E. Dodge Boat & Plane Corp. The company also announces the purchase of the former Bendix plant, Wayne, Mich., from the War Assets Administration, and will transfer the Detroit operations to the new site, with the exception of the body plant.

H. K. Porter Co., Inc., Pittsburgh, Penn., has moved the Boston office from 38 Chauncy St., to 294 Washington St. American Chain & Cable Co., Inc., Bridgeport, Conn., has appointed Emerson H. Todd as sales manager of the



This 2½ cu. yd. Sauerman Power Scraper cuts deeply into hill of gravel and moves about 85 cu. yd. of material an hour to crusher. The scraper tail-block is attached to a movable A-frame located on the brow of the hill.

### Great Flexibility

Sauerman machine can reach across a stream, pond, pit or stockpile or to top of hill and move material rapidly from any point within its cable radius. The radius can be extended as far as 1,000 ft. or more.

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At sand and gravel screening plants, stone crushing plants, cement mills—in fact, wherever there are problems of excavating or stockpiling bulk materials—Sauerman Crescent Power Scrapers daily demonstrate their ability to dig and deliver large tonnages of materials at costs of a few cents a ton handled.

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Operation requires only one man at the controls. Any workman is easily trained for the job. Power consumption is small. Installation and upkeep costs are surprisingly low.

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cable and hazard wire rope divisions, succeeding Frank W. Bemis who resigned to enter another line of business in Omaha, Nebr. George Gunther has succeeded Mr. Todd as Chicago district manager for the wire rope divisions.

Lima Locomotive Works, Inc., Lima, Ohio has announced the appointment of the following Canadian sales distributors for shovels, cranes and draglines: Armco Drainage & Metal Products of Canada, Ltd., Winnipeg, for Manitoba and Saskatchewan territories; Equipment Sales & Service, Ltd., Toronto, for Ontario; Automotive Products Co., Montreal, for Quebec; and Dietrich-Collins Equipment Ltd., Vancouver, for British Columbia.

Chicago Steel Foundry Co., Chicago, Ill., has announced that Capt. C. McA. Evans, now on terminal leave after 5½ years' service in the Navy, has been elected president of the company. He is the son of David Evans, elected chairman of the board. Captain Evans graduated from the United States Naval Academy in 1924, and following graduation went to work for the Chicago Steel Foundry Co., as a timekeeper.



Capt. C. Evans

He joined the Illinois Naval Reserve, and at the time of the outbreak of war was commander of the 27th Division, Illinois Naval Reserve. His entire division was taken into the Navy, and Capt. Evans became gunnery officer on a submarine tender. His ship arrived a few days before the attack on Pearl Harbor, but fortunately there were no casualties. He was later placed in command of a submarine destroyer, and then followed promotions as assistant chief of the Pacific Training Command at Seattle, executive officer of an armed transport, and then command of his own ship when he became captain. Captain Evans was vice-president of Chicago Steel Foundry Co., when he entered the service at the outbreak of the War.

Traylor Engineering & Manufacturing Co., Allentown, Penn., has announced the appointment of Lt. Col. Clyde W. Spears as special sales engineer. He is a graduate of the Colorado School of Mines and also pursued post-graduate studies in chemistry at the California Institute of Technology. Prior to his army service Col. Spears was with the Department of Agriculture for a period of seven years on flood control projects. He entered the service in May of 1942 and was assigned to the 833rd Engineering Aviation Battalion. After the usual training period he was sent to England with his unit to build large bomber air bases and was with the advance of the Allied armies which finally ended in Munich, Germany. Col. Spears was awarded a bronze star medal for meritorious service. He received his discharge from the army on February 12, 1946.

Wellman Engineering Co., Cleveland, Ohio, has announced the appointment of Asa Shiverick as district sales manager of the clamshell and dragline bucket department, New York, N. Y.

New York Belting & Packing Co., Passaic, N. J., has appointed George G. Deverall as sales representative in New England, New York, New Jersey and eastern Pennsylvania, with headquarters at Passaic, N. J.

St. Regis Paper Co., New York, N. Y., has appointed F. Ray Linda assistant to Carl H. Hartman, director of technical development and vice-president of St. Regis Sales Corp.

Fairbanks, Morse & Co., Chicago, Ill., announces the appointment of E. A. Foster as manager of the application engineering department of the railroad division, with headquarters in Chicago.

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*certified*  
centrifugal  
pumps

UNLIKE ordinary pumps, Carver Pumps have only two parts that are subject to wear—the impeller and liner. Both are designed to keep wear to a minimum. The impeller vane can wear only on one side. Backhead of the pump lasts a lifetime because impeller does not wear against it. When wear eventually occurs in the impeller and liner, they can be replaced easily, quickly and at low cost thus making the pump as good as new.



Carver Pumps are offered with a choice of power and mounting in sizes from 1½" to 10". Write for catalog.

CUTS PUMPING COSTS

**CARVER PUMP CO.**

Muscataine, Iowa





**FASTER WELDS...  
EASIER APPLICATION...  
Same high WEAR RESISTANCE**

With the New  
**Coated STOODY  
SELF-HARDENING**

**U**SERS of hardfacing alloys have long been acquainted with Stooddy Self-Hardening, the low-cost rod that provides 2 to 1 wear resistance over manganese steel. Now a new, improved extruded flux coating brings even better welding characteristics to this old favorite!

**EASY APPLICATION** with both AC and DC welding machines in a wide range of amperages.

**STEADY ARC** with fast deposition rate. No slag interference.

**CAN BE HANDLED IN ALL POSITIONS** WELDS IN ANY BEAD TYPE

**SOLID, DENSE DEPOSITS** with an absolute minimum porosity.

**SELF-LIFTING SLAG** for easy clean-ups.

**STRONG BONDS** with all steels including manganese.

Use the new **COATED STOODY SELF-HARDENING** for maximum protection against earth abrasion and impact on all heavy equipment. Available in 1/4", 3/8" rod diameters.

**ORDER NOW!** 50 lbs. of the NEW COATED STOODY SELF-HARDENING will convince you it's easier to use, faster to apply and still tops for wear protection! Costs only 50c per pound f. o. b. distributors' warehouse or Whittier, Calif

**Buy some Today!**

**STOODY COMPANY**  
1129 W. SLAUSON AVE., WHITTIER, CALIF.

**STOODY HARD-FACING ALLOYS**

Retard Wear Save Repair

J. F. Weiffenbach has been appointed chief engineer; Frank Ross, Jr., sales engineer in charge of locomotive sales in St. Louis; Frank M. Bosart, eastern manager of locomotive sales in New York; and Robert Aldag, Jr., sales engineer in Chicago.

Howe Scale Co., Rutland, Vt., announces the appointment of J. G. McCarty as Pittsburgh branch manager, succeeding H. J. Steidley, who has retired.

John A. Roebling's Sons Co., Trenton, N. J., has announced the promotion of Forest S. Burtch to manager of sales, wire rope division, and William Hobbs, Jr., to manager of sales, aircord division. Mr. Burtch succeeds Earl N. Graf, who recently resigned. He joined the staff of the Roebling wire rope engineering division in 1923, and in 1934 was appointed assistant chief engineer. In the latter capacity, Mr. Burtch made many contributions to the design, manufacture and application of wire rope. In 1943 he was appointed manager of sales for the aircord division and remained in this position until his recent appointment. Mr. Hobbs joined the company in 1934 and has designed and been instrumental in marketing several new wire rope products.



Forest S. Burtch

H. K. Porter Co., Inc., Pittsburgh, Penn., has purchased the business of the American Spiral Spring & Mfg. Co., Pittsburgh, which will be operated, together with the present Porter Fort Pitt Spring plant, as American-Fort Pitt Spring Division of the company.

Adel Precision Products Corp., Burbank, Calif., announces the appointment of Ed. J. Towey as sales manager, industrial division. Mr. Towey was formerly executive vice-president in charge of sales, engineering, advertising and development of new products for the Diamond Iron Works, Minneapolis, Minn.

Sheffield Steel Corp., Kansas City, Mo., has appointed C. W. Hagenbuch as assistant vice-president. Mr. Hagenbuch



C. W. Hagenbuch

became associated with the company in 1920 as plant efficiency engineer and has since served as head of the Cost Accounting Department, in the development and sales of products such as grinding media; office manager and production manager, and manager of grinding media.

Holub Industries, Inc., Sycamore, Ill., a new concern recently organized by Bert E. Holub, formerly an officer and general sales manager of Ideal Industries, has begun the manufacture of electrical and mechanical products in a new plant at Sycamore, Ill. Gordon W. Wetzel, formerly Mr. Holub's assistant at Ideal, will be sales manager of the new concern.

Taylor-Wharton Iron & Steel Co., Easton, Penn., has appointed John R. Craig as assistant to the vice-president in charge of sales. Mr. Craig was recently released from active Naval service.

Colorado Fuel & Iron Corp., Denver, Colo., has appointed Sidney E. McCrum as advertising manager of the Wickwire Spencer Steel Division. He was assistant advertising manager of Wickwire Spencer prior to the merger of the two companies.

Hewitt Rubber Corp., Buffalo, N. Y., division of Hewitt-Robins, Inc., Phila-

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of the

**KNOX**  
Valves-Couplings-Nipples-Clamps-Hangers  
**CATALOG**



KNOX MANUFACTURING CO.

818 Cherry St. Phila. 7, Pa., U.S.A.  
SINCE 1911 PRODUCERS OF

**KNOX**  
Valves-Couplings-Nipples-Clamps-Hangers



delphia, Penn., has moved its district office and warehouse from 20 South 15th St. to 401 N. Broad St., under the supervision of C. F. Holden and Jack T. Sheldon.

American Well Works, Aurora, Ill., has appointed Alvin Haas as vice-president and general manager. He was formerly general manager of the Yates American Machinery Corp.

Caterpillar Tractor Co., Peoria, Ill., announces the appointment of Virgil V. Grant as treasurer of the company, succeeding W. J. McBrien who was elected a vice-president in May, 1944.

Marmon-Herrington Co., Indianapolis, Ind., has announced that David M. Klausmeyer, C. Alfred Campbell, Guy C. Dixon and Earl J. Breech have been elected to the board of directors.

Joseph T. Ryerson & Son, Inc., Chicago, Ill., has announced a new steel-service plant now under construction in Los Angeles, Calif., to serve the West Coast area.

Independent Pneumatic Tool Co., Chicago, Ill., has opened a new branch sales office in St. Paul, Minn., with Joseph A. Bell as manager.

Davey Compressor Co., Kent, Ohio, has appointed the Wabash Equipment & Supply Co., Indianapolis, Ind., as distributor of Davey compressors.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has named R. W. Gillmore as manager of the new branch office in Evansville, Ind.

Worthington Pump & Machinery Corp., Harrison, N. J., announces that Joseph W. Sargent, formerly manager of the Eastern region of the company's construction equipment division, has accepted the position of manager of construction equipment sales for the American Air Compressor Corp., exclusive distributor of Worthington-Ransome construction equipment for northern New Jersey.

Sullivan Division of Joy Mfg. Co., Michigan City, Ind., announces that R. C. Osgood, chief engineer and manager of the hoist division; J. A. Drain, vice-president in charge of engineering, and the late Alton Hilliard, assistant to Mr. Osgood, received special recognition as a part of the Naval Ordnance Development Award recently conferred on the division, for distinguished service to the research and development of Naval Ordnance.

Nordberg Mfg. Co., Milwaukee, Wis., has a Half Century Club composed of employees who have been with the company for 50 years. Members of the club are Hans Krogstad, assembly department, an employee for 54 years; E. C. Bayerlein, chairman of the board and for many years vice-president and general manager, has served the company for 52 years; L. C. Baumgarten, installation and service engineer, has been with the company for 54 years; and Charles Poller, traffic manager, has seen 52 years of service.

A. M. Byers Co., Pittsburgh, Penn., has announced the appointment of George B. Coffey as manager of the Chicago division, succeeding W. A. Taylor who has resigned to enter private business.

St. Regis Sales Corp., subsidiary of the St. Regis Paper Co., New York, N. Y., has opened a branch office in Allentown, Penn., under the supervision of J. Lea Fearing, Jr.

Industrial Brownhoist Corp., Bay City, Mich., announces the retirement of James B. Hayden as vice-president in charge of sales and the election of Max Riebenack III to take his place; also the appointment of H. D. Wright as director of sales Eastern Seaboard; C. H. White as director of sales, south and western portions of U. S.; A. P. Lyvers as district sales manager in Chicago; and Stanley See as district sales manager in Philadelphia. James A. Peppard continues as district sales manager in Cleveland.

U. S. Rubber Co., New York, N. Y., has purchased a government-built plant in Fort Wayne, Ind., for the production of industrial rubber products.

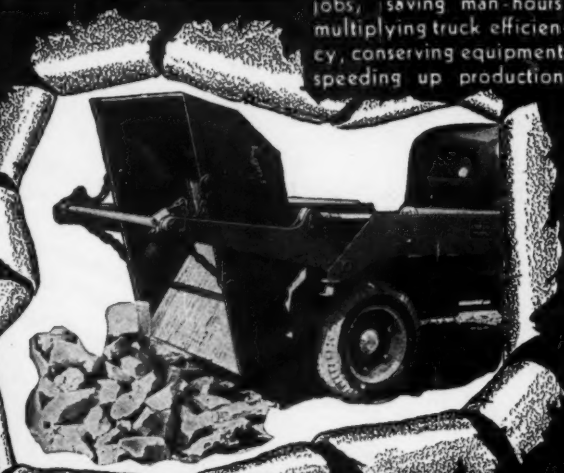
## Breaking into Today's News!

### Brooks **LOAD LUGGER**

is making sensational records on material moving jobs, saving man-hours, multiplying truck efficiency, conserving equipment, speeding up production

Use 5 to 10 dump buckets with one Load Lugger. It beats a fleet of ordinary trucks.

Easy to mount on any chassis. Only 15 seconds for picking up or dumping load. Ask for Catalog.



America's safest, simplest, fastest mechanized loading and dumping unit, for quarry, highway, industrial or construction work.

## Brooks EQUIPMENT AND MFG. CO.

Distributors in all Principal Cities

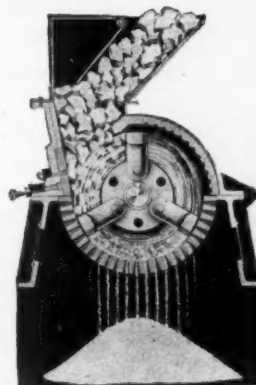
103 Davenport Rd., Knoxville 8, Tenn.

## 45,000,000 TONS OF LIMESTONE!

What part of this tonnage will your plant produce in 1947?

Do you know that Gruendler Pulverizers are producing over six million tons annually?

And NOW with the many orders in our plant for more Gruendler Pulverizers scheduled for Fall shipment, an additional million tons of Pulverized Limestone will be credited to GRUENDLER.



If you are thinking of increasing your production in 1947 we suggest you place your order Now for Additional Gruendler Equipment.

GRUENDLER CRUSHERS and PULVERIZERS are known for their sturdy construction and dependability. For over 60 years your Standard for Comparison.

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# GRUENDLER

CRUSHER & PULVERIZER CO., Dept. L, 2917 N. Market, St. Louis 6, Mo.

# GOVERNMENT-OWNED SURPLUS

## STEEL...



### FREE INFORMATION

To War Assets Administration:\*

Please send me full information, including availability and pricing of the following:

Carbon and Alloy Billets and Blooms ☐—H. R. & C. R. Alloy Sheets ☐—Strip and Plates ☐—Stainless Steel Sheet and Strip ☐—Mechanical Tubing, Carbon and Alloy ☐—Standard Type Valves and Fittings ☐

NAME.....TEL. NO.....

FIRM.....

ADDRESS.....

CITY.....STATE.....

\*Send coupon to nearest Regional Office below for fast service.

STEEL can be bought now through War Assets Administration, for immediate shipment to you. Alloy steel billets, blooms and many items of alloy steel bars, particularly in the larger sizes, are available in Chicago, Cleveland, Detroit and other Regional Offices.

Lowscale prices make it worth your while to buy this high-grade material, even if you intend it for low-cost products.

Carbon and alloy steel mechanical tubing is also available in a wide range of sizes and specifications. Contact your nearest War Assets Administration Office below, or clip and mail the coupon.

All steel is subject to priority regulations. VETERANS OF WORLD WAR II are invited to be certified at the War Assets Administration Certifying Office serving their area and then to purchase the material offered herein.

### EXPORTERS

Most surplus property is available to the export market. Merchandise in short supply is withheld from export, and if such items appear in this advertisement they will be so identified by an asterisk.

# WAR ASSETS ADMINISTRATION

Offices located at: Atlanta • Birmingham  
Boston • Charlotte • Chicago • Cincinnati  
Cleveland • Dallas • Denver • Detroit • Fort  
Worth • Helena • Houston • Jacksonville  
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Louisville • Minneapolis • Nashville • New  
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Richmond • St. Louis • Salt Lake City • San  
Antonio • San Francisco • Seattle • Spokane

# ROCK PRODUCTS CONCRETE PRODUCTS and Cement Products

Gravity system speeds handling of materials in block plant



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# AVAILABLE!! NOW!!

## The New Improved "ROCKERCRETE" Block Machine

**"PLEASE YOUR BANKER"—MORE PRODUCTION PER MACHINE DOLLAR**  
**"NOT A TOY": MAKE SPECIFICATION, Even Density Blocks.**

*Most Ingeniously Designed Machine in Medium Field*

MANUFACTURED  
BY LINK-BELT  
COMPANY, ATLANTA, GA.  
UNDER ROY DARDEN PATENTS



**[OTHER EQUIPMENT AVAILABLE  
FOR COMPLETE PLANTS]**

- ➔ STEEL AGGREGATE BINS
- ➔ FEED HOPPERS
- ➔ RUGGED MIXERS
- ➔ CONVEYORS
- ➔ BUCKET ELEV. UNLOADERS

- ➔ STEEL RACKS
- ➔ PALLETS
- ➔ PNEUMATIC TIRED HAND TRUCKS
- ➔ MOTORIZED TRUCKS
- ➔ MISCELLANEOUS ACCESSORIES

**ROY DARDEN INDUSTRIES  
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313 BONA ALLEN BLDG.

ATLANTA, GEORGIA

**ROY DARDEN INDUSTRIES  
SOUTHWESTERN DIV., INC.**

1125 STONEWALL ST.

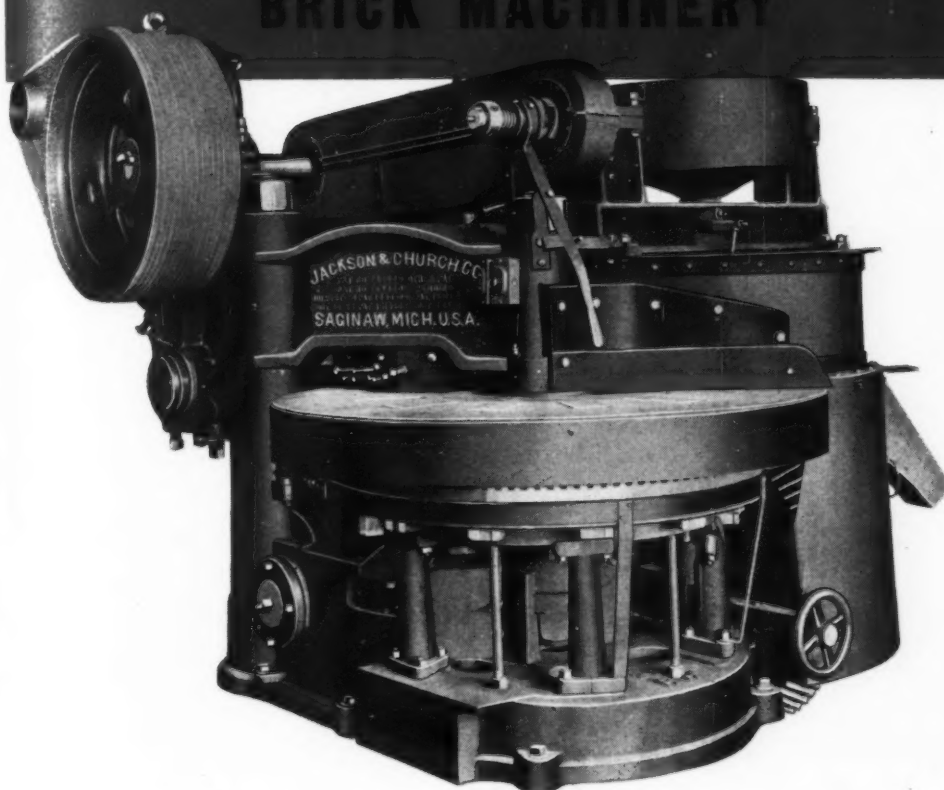
DALLAS 10, TEXAS

CABLE ADDRESS: "DARDEN"

IT'S TIME TESTED....

## CONCRETE AND SANDLIME BRICK MACHINERY

J & C



Model A Brick Press makes 60 bricks per minute, 28,000 bricks per 8-hour day. (Smaller Model NC press makes 30 bricks per minute, 14,000 bricks per 8-hour day.)

J & C sand lime brick machines in use 35 years are still making quality brick every day. The present models are worthy successors to our rugged, earlier models.

### OUTSTANDING FEATURES OF J & C BRICK PRESS

Automatic operation, uniform filling of mold pockets, feed synchronized with table movement, adjustable feed, mold depth regulator, hardened saw steel mold liners, slow moving parts, long-lived, automatic tabletop for removal of brick and shear pin prevents overload.

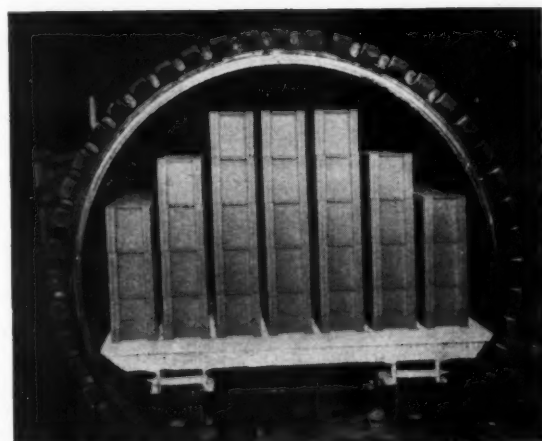
### FOR BETTER BRICK

Lean mixes, higher strengths, low absorption, sharp corners and edges, troweled end and sides, fine textured surface, uniform appearance, accurate sizing, handle easy—lay fast.

### Step Up Deliveries to Meet Demand with J & C High Pressure Steam Kilns

With demand for brick and block at a record high, pressure curing insures quick delivery, steps up quality, reduces heavy investment in stock piling.

J & C's long experience in pressure curing, backed by hundreds of installations, insures best possible steam kiln design for your post-war plant. J & C steam cured brick or block is free from spalling, crazing, checking, leaching, efflorescence, volume changes, expansion or contraction when laid in dry wall.



WRITE FOR COMPLETE INFORMATION

JACKSON & CHURCH COMPANY • SAGINAW, MICHIGAN



AT LAST...THE LIGHT WEIGHT CONCRETE MASONRY UNIT HAS A PERFECT WATERPROOFING PARTNER

## ...AQUELLA!

What does this "partnership" mean to you as an architect, engineer or contractor planning or constructing a building of light weight concrete masonry units?

It means simply this...

That now...with Aquella adding the advantage of *watertightness* to the desirable construction qualities this type of masonry provides—you have a building material excellent in every respect.

Furthermore...Aquella also gives an attractive, glistening white, egg-shell-like finish that is truly beautiful in its natural color—or when

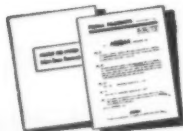
painted to match any decorative scheme. Aquella does not powder or rub off, nor does it blister, peel or flake.

### Specify Aquella for Brick, Concrete, Stucco or Cement Plaster

Aquella is the new, scientific way to insure watertightness inside or outside...above or below ground...on all porous masonry surfaces, such as brick, concrete, stucco or cement plaster.

SEE DATA IN SWEET'S CATALOG

You'll want this information for your waterproofing file



Write today for your copies of "Aquella and Concrete Masonry Construction," and the "Key to Aquella Specification Types."

### PRIMA PRODUCTS, INC.

Dept. A5, 10 East 40th Street  
New York 16, N. Y.



500-lb. Hydrostatic Pressure Test Proves that Aquella Makes Cinder Concrete Block and Other Porous Masonry Surfaces Watertight

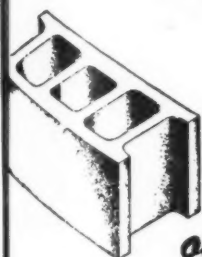
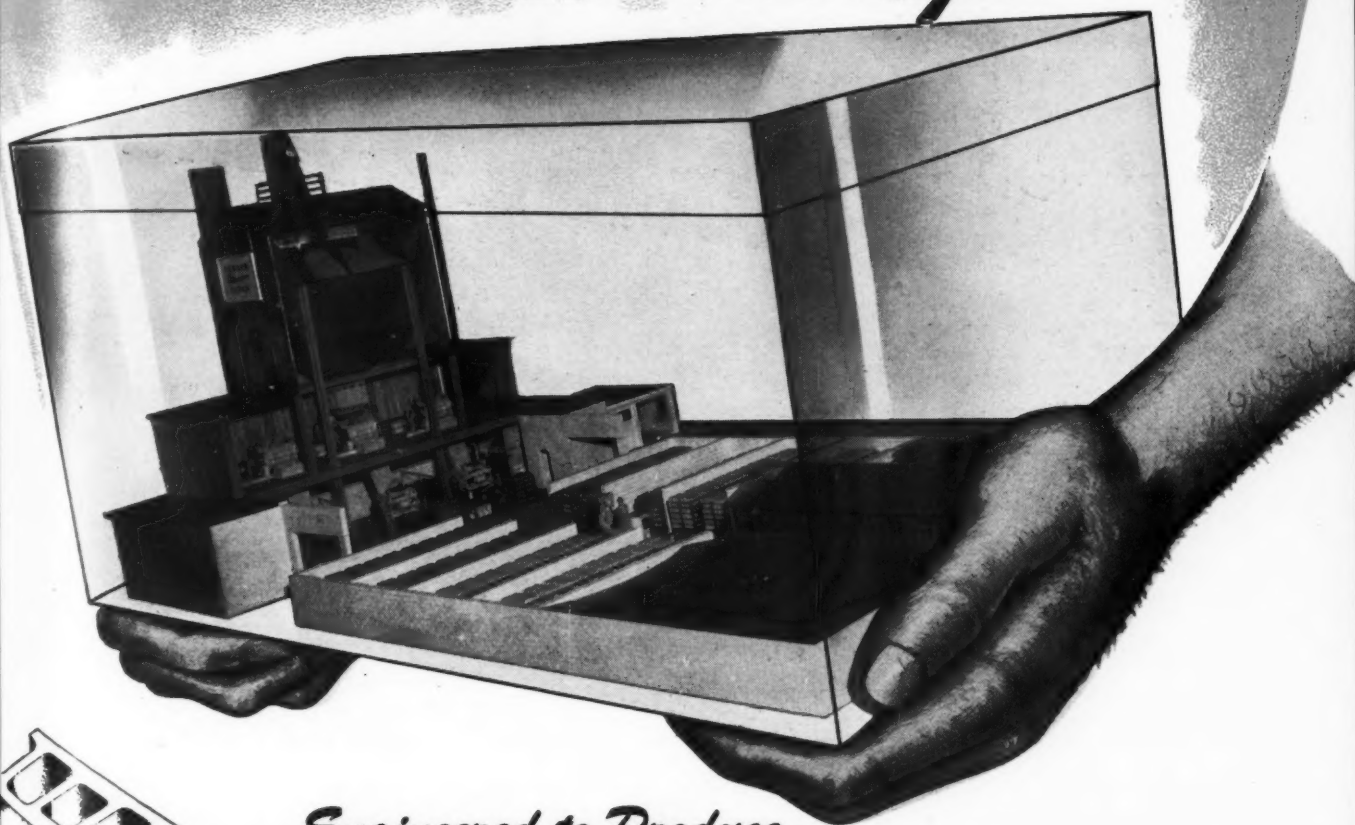
First, both of the columns you see here were tested in their natural state and showed that they had identical coefficients for permeability. After such tests, the column on the *left* was treated with Aquella, while the one on the *right* was not. The Aquellized column withstood the pressure of an 8-ft. head of water, equivalent to a hydrostatic pressure of approximately 500 lbs. per sq. ft. The untreated column could not be filled with water higher than 18¾", because the water seeped through the cinder blocks at the rate of 2 gallons per minute.

Aquella, having proved its effectiveness on cinder concrete blocks, under conditions as extreme as this, must necessarily be equally successful when applied to other types of masonry construction such as concrete, brick, stucco or cement plaster.

**AQUELLA IS A "MUST" on every light-weight concrete masonry unit job!**



# BESSER offers a . . . COMPLETE PRODUCTS PLANT in "One Package"



*... Engineered to Produce*  
**VIBRAPAC QUALITY BLOCK**  
*on a Fast Production Basis!*

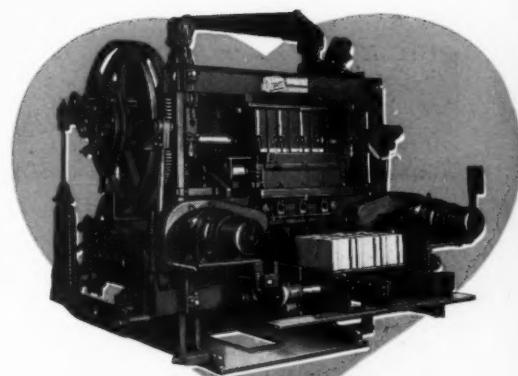
The Besser Mfg. Co. does more than merely supply you with a concrete block machine. Besser plant engineering service covers all necessary equipment for handling and processing aggregates and other materials, and all operations of manufacture, curing, handling and loading of block. . . . and Besser even helps to increase your sales by stimulating the demand for Vibrapac Quality Block.

If you intend to erect a new concrete products plant . . . or are merely planning on expanding your present plant . . . be sure to consult a Besser engineer. Without obligating you, he will gladly give you the benefit of his broad experience in this specialized field.

**BESSER MANUFACTURING COMPANY**

Complete Equipment for Concrete Products Plants

209 46th STREET, ALPENA, MICHIGAN, U. S. A.

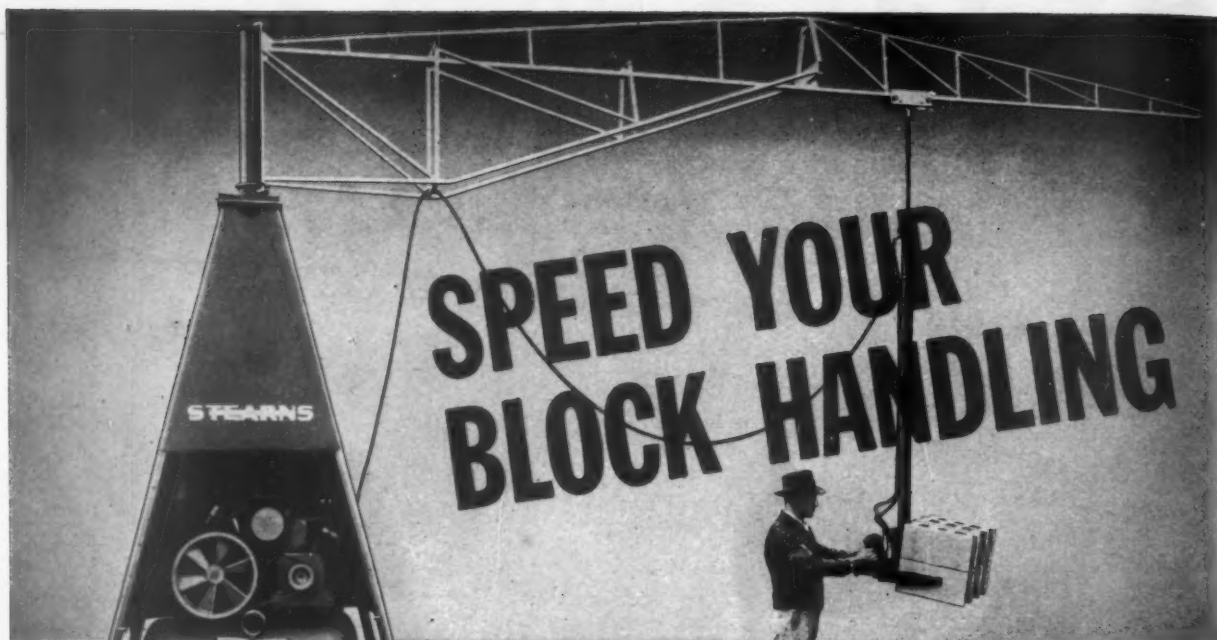


**BESSER SUPER VIBRAPAC**  
— the "Heart" of the Plant

Continuous, full capacity operation, fully automatic. Produces three 8" x 8" x 16" block at a time on one plain pallet. Capacity 600 block per hour. Smaller units made in larger multiples on the same pallets.

**BESSER** PLAIN PALLET **VIBRAPACS**

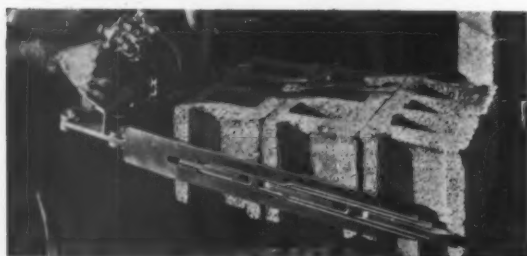
THE SAVING IN PALLET COST  
WILL PAY FOR A  
BESSER VIBRAPAC  
PLAIN PALLET STRIPPER



STEARNS YARDHOIST is shown above with gasoline-driven compressor mounted on its base. Six standard blocks are being lifted, which is general practice in lifting cured block from stock pile to truck.



Clamps gripping the 8x16-in. faces of block handle three 8x8x16-in. blocks or multiples of their equivalents from rack to stock pile. Note that block are being stacked close together for later handling with fork lift trucks.



Different clamps are used to lift plain or cored-end block endwise. Groups of block may be placed with only 1 1/4-in. space between them for later rehandling by the Yardhoist from stock pile to trucks.

## with a STEARNS-Warren YARDHOIST

PATENTS PENDING

● Handling eight hundred 8x8x16-in. cured blocks per hour from racks to stock pile or from stock pile to trucks is just an average performance for this machine. Many plants are using this equipment now—and with remarkable savings in handling costs.

● You can quickly spot YARDHOIST in any part of the yard . . . It eliminates expensive hand labor . . . reduces block breakage.

● Available in two models (1) as illustrated or (2) without gasoline-driven compressor . . . air to be supplied from centralized compressor by hose from plant.

**Write today for illustrated bulletin.  
Every detail is fully explained.**

# STEARNS

GENE OLSEN, PRESIDENT

*Pioneers in the design, manufacture and distribution of modern machinery for producing concrete masonry units . . . Vibration and tamp-type block and brick machines . . . Mixers . . . Skip Loaders . . . Yardhoists.*

## New Plant Built to Meet Big Demand for Floor Slabs

Cities Fuel & Supply Co., West Allis, Wis., makes roof and floor slabs with units assembled from concrete block

By RALPH S. TORGERSON

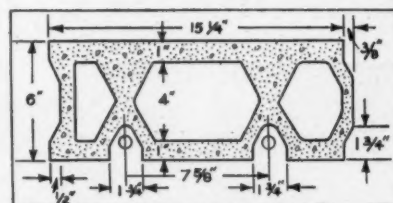
**A**BOUT three years ago, the Cities Fuel & Supply Co., West Allis, Wis., developed a floor and roof slab which was assembled from specially designed patented block, that could be made on any block machine capable of producing accurately aligned masonry units. It is known as the Dox-Blox roof and floor system. A description of the manufacture of the floor and roof slab appeared in the December, 1943, issue of *Rock Products*.

Demand for this concrete structural member has grown so rapidly in the Milwaukee territory that a new plant was erected to increase production. Present indications point to the need for increasing these facilities, and a further expansion is under consideration.

Briefly, the roof and floor slab comprises units which are 16 in. wide, 8 in. long and 6 in. deep, assembled with reinforcing rods into "planks" of various lengths up to 16-ft. clear.

These units are laid face to face, bottom side up, to the desired length on a concrete assembly slab. To accurately align the units, two lengths of steel pipe which just fit are laid into the reinforcing rod grooves cast into the units. After removal of the pipe sections, reinforcing rods are placed within the grooves which are then grouted with a 1:3 mix. The illustrations show the assembly line floors in the new plant, the roller conveyors for handling the units, and the hoists for transporting the finished roof and floor slabs.

The new plant is 60 by 108 ft. in plan with walls 14 ft. high. Masonry units are 8- x 12- x 16-in. Waylite concrete. Structural steel members comprise 8-in. H columns supported on concrete piers, load-bearing beams are 14 in., and struts are 8-in. I beams. Some of the 8-in. I beams serve as the monorail track supporting P & H Ziplift electric hoists, each of one-ton capacity. There are three



Details of special block designed for assembly into concrete "plank." Note recesses for reinforcing rod

monorails over 300 ft. of assembly lines.

Production for three men is approximately 67 plank per 8-hr. day or about 2000 sq. ft. of concrete floor and roof slab units with 9 men in an 8-hr. day.

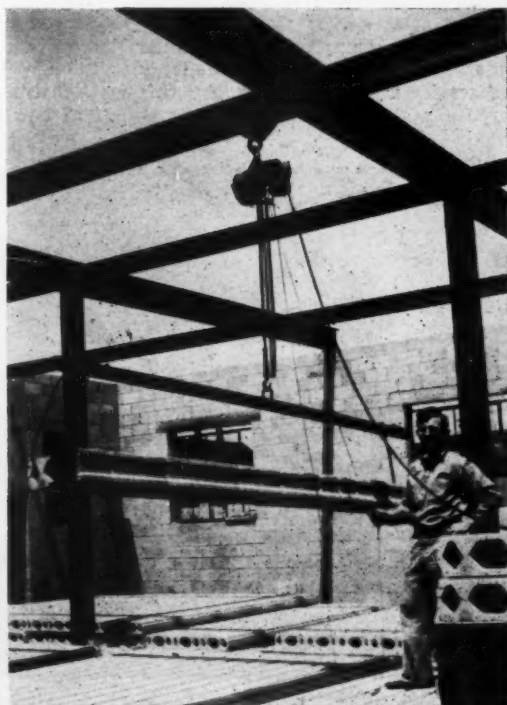
Equipment which is required for assembling the finished slab is comparatively simple. An electric Wonder concrete mixer made by Concrete Machinery Co., Waterloo, Iowa, with 1½-cu. ft. capacity, supplies the concrete grout to fill the reinforcing rod grooves, and a Chicago Pneumatic chipper vibrates the grout in place. A grout bucket with a spout just wide enough to fit in the grooves of the units prevents spillage and speeds up the grouting work.

It will be noticed in the illustrations that the roof on the new plant has not been completed. Demand was so heavy that production had to be started before the roof could be completed. This roof, of course, will be constructed with Dox-Blox concrete roofing slabs made by the company.

(Continued on page 136)

Right: Close-up of electric hoist and monorail system which moves finished floor and roof slabs into storage by means of specially designed yoke which has arms engaging openings at ends. "Doc" Vander Heyden is operating hoist

Below: Looking down assembly lines, showing hoist and monorail system for each line





*Diversify*

## Manufacture Burial Vaults in Two Plants



Line-up of trucks for delivery of concrete burial vaults. Note trademark on truck body

**S**TARTING PRODUCTION of concrete masonry units in 1939, Katterjohn Concrete Products Co., Paducah, Ky., has become one of the outstanding producers in the South. Recent additions to the concrete block plant have more than tripled output. Another important branch of this company's operations, which has had a rapid growth, is the manufacture of concrete burial vaults.

Operating since late 1941 under the Berg Vault System license, the company has produced an average of five "Bronzeoleum" vaults per day at the Paducah plant, and in 1944 started production at a new plant in Nashville, Tenn. Manufacture of vaults under this license includes delivery and service at the cemetery. For this purpose a fleet of trucks with spe-

By H. E. SWANSON

### Katterjohn Concrete Products, Paducah, Ky., starts new concrete burial vault plant at Nashville, Tenn. New machinery in Paducah plant triples block capacity

cially-designed bodies is operated. More than 75 counties in Kentucky, Illinois, Missouri, and Tennessee are served by these two plants.

#### Vault Manufacture

Crushed limestone and sand aggregates with high early strength cement

mixed in a 10S Koehring mixer, comprise the mix for vault manufacture. The vault is cast in two sections, a base and a dome, with No. 9 electric welded wire mesh spaced 6 x 6 in. for reinforcing. The base is cast first, in a steel form, and when the concrete has set, a sheet of heavy paper is placed over it, and the steel forms for the dome are placed on top. The single inner form is placed over the base, reinforcing is put around the form, and then the four walls are placed around it and secured. Concrete is poured and externally vibrated by a New Haven vibrator, which is also used to vibrate the base. By casting the top on the base, a perfect joint is made, and the paper prevents the fresh concrete from adhering to the base. This method of



Two vibrating types of block machines speed up operations, tripling production

forming the joint is a feature of the Berg vault, which employs the air-seal principle of vault construction. When the finished vault is placed in the grave, the weight of the upper section bearing on the base prevents water or seepage from entering the vault due to the entrapped air in the dome.

After the concrete has hardened, the forms are stripped and the entire vault is moved to steam curing rooms for a period of 12 hours. After curing, the vault is stippled. The copper coat is sprayed over the vault and asphalt is applied to give the bronze color effect symbolic of the Bronzoleum vault. When dry, the finish is burnished to give it a glossy sheen. Six sizes are made, ranging from the small 17- x 38-in. inside measurement to the large 36- x 90-in. inside measurement. About 125 finished vaults are kept in stock.

Prior to the installation of a Richards Wilcox monorail system with a Quick Lift 3000-lb. electric hoist, the vaults were moved on wooden dollies and, when placed in storage, had to be jacked up before they could be removed from the dolly. Since the installation of the monorail system late in 1945, vaults are moved more quickly and with less labor to the desired location for storage, and from storage to the trucks.

Shown in an accompanying illustration is the fleet of trucks which deliver the vaults to the cemetery. Vaults are placed on a wooden roller dolly on the delivery truck. The vault is rolled down the skids off the truck by a block and tackle. Compartments in the delivery truck are provided for all accessories, including a chrome-plated Berg lowering device which is assembled at the cemetery for supporting the vault over the grave and for lowering the vault and casket into the grave.

### Block Plant

Additions made to the block plant late in 1945 include a Besser Super Vibrapac, a Butler Carscoop, an Erickson lift truck, and a Stearns-Warren yard hoist. A new curing room was also built to handle the extra production.

Both cinder and concrete "Katter-Blox" units are produced. Cinders are received locally by truck, crushed limestone from local quarries by rail, and sand by truck. All are stockpiled on a concrete paved area adjacent to the plant and transported to the mixers by the Butler Carscoop, which is equipped with a 12-cu. ft. bucket for measuring the aggregates. The Carscoop can easily serve both mixers, and does the double job of volumetric measurement of aggregates as well as movement from stockpile to mixer. In addition to the new Vibrapac, block are produced on a Stearns Joltcrete.



Attractive display sign and wall samples showing how concrete masonry may be used



Monorail system and electric hoist are used to store finished concrete burial vaults



Top forms are placed over completed base of vault and dome is cast with heavy paper separating the two sections



Aggregates are transported from stockpiles to mixer by 12 cu. ft. car scoop which also serves to measure materials volumetrically

Finished block are placed on wooden and steel racks, the former with a capacity of 48 standard units, serving the Stearns machine, and the latter with a capacity of 60 standard units, serving the Besser. Racks are transferred to curing rooms by five Barrett-Cravens lift trucks while an Erickson lift truck moves them from the rooms to the storage yard.

At present there are six curing rooms, five with a capacity of 24 steel or 22 wooden racks each and the sixth with a capacity of 36 steel or 33 wooden racks. Steam is released into the rooms at 30 p.s.i. by a new 45-hp. high pressure Kewanee boiler, Iron Fireman stoker fired, each room being equipped with a ¾-in. pipe with perforations spaced at 2-ft. centers. Each room also is equipped with a 1½-in. pipe providing heat, for more thorough curing.

Block are removed from racks and placed in storage, and trucks are loaded with the Stearns-Warren yard hoist, which has materially speeded up yard handling. Delivery is made by local trucking concerns on a contract basis.

George W. Katterjohn is the owner of Katterjohn Concrete Products. Robert L. Leigh is general superintendent of the Paducah plant, and H. C. Karraker is superintendent in charge of production. Perce Clement is office manager.

## Calif. Products Meeting

NORTHERN CALIFORNIA CONCRETE MASONRY ASSOCIATION will hold a meeting at the Leamington Hotel, Oakland, Calif., on September 20. E. W. Dienhart, executive secretary of the National Concrete Masonry Association, will be the principal speaker.

## Making Concrete Brick

GOULD-LOBERG BRIKCRETE PRODUCTS, Cape Girardeau, Mo., operated by Emery L. Gould and Lloyd E. Loberg in partnership, is now producing 4000 3- x 4- x 12-in. units or 2000 3- x 8- x 12-in. units per 8-hr. shift. Corner and half units are also manufactured. The concrete brick manufactured are water-proofed, colored, hollow, load-bearing units. Mr. Gould is plant manager and Mr. Lloyd is sales manager.

## Pavement Yardage

AWARDS of concrete pavement for July and the first seven months of 1946 have been announced by the Portland Cement Association as follows:

	SQUARE YARDS AWARDED	
	July, 1946	First 7 Mos., 1946
Roads .....	1,431,003	14,567,163
Streets and Alleys...	1,240,618	6,429,275
Airports .....	384,720	1,967,775
Total .....	3,056,341	22,964,213



Block being lifted to loading platform from which trucks are loaded direct from racks

## Big Cinder Concrete Plant

DURO-CRETE Co., East Providence, R. I., is building a new cinder concrete block plant which, with equipment, will eventually cost about \$250,000, according to Chas. Berg, sales manager. Production will be in two shifts with three Besser Super Vibrapacs which will make possible a production of 35,000 block every 24 hours. There will be seven low pressure steam curing rooms, 75 ft. long.

## Buys Vault Concern

DONALD C. CANHAM, a discharged veteran, has purchased the Synthetic Granite Vault Co., Medina, N. Y., formerly operated by Fred Bulemore.

## Produce Sand-Ready Mix

MEGARRY BROS., St. Cloud, Minn., recently placed in operation a sand plant and ready mixed concrete plant. Production will be about 60 tons of washed sand per hour, and five transit mixer units will be in operation. Equipment includes a Pioneer washing plant, Butler bins, hopper and conveyor.

## Lift Truck for Block

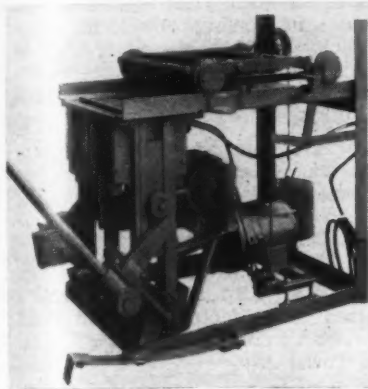
THE TOWMOTOR CORPORATION, Cleveland, Ohio, has two of its lift trucks in service by Geist Coal and Supply Co., Cleveland, Ohio, transporting 350 tons of concrete block produced each day by this company. This production is about 24,000 concrete block in 24 hours of operation. Two Besser Vibrapac machines manufacture the block. The lift truck, shown in the illustration, takes loaded racks from the machines to curing rooms, removes block from the curing rooms, and then transports the block to storage or loading areas. A loaded rack of 72 "green" block is moved 30 ft. from the machines to the curing room in 45 seconds. Elapsed time for taking a rack of cured block from the curing room to a storage pile 125 ft. distant was 93.6 seconds. This included lifting the load 64 in. to shelf storage.



## Oscillator Block Machine

FRANK I. BLATT SALES CO., INC., Rattlesnake, Fla., has announced that the Hendry Corporation is now in production of the Kissam-Blatt controlled oscillator block machine. Allen Kissam, Orlando, Fla., of the Kissam Builders' Supply Co., is the designer of this machine.

This machine features controlled oscillation of the cores only. It is



Block machine in which oscillation is imparted to cores only

claimed that by using this method, it is possible to increase the number of blocks per bag of cement from 18 to 28 and still get tests which range as high as 800 p.s.i., in three to four days, and up to 1300 p.s.i. in eight days.

Two factors are involved in making water-proof blocks with this machine, according to the manufacturer. First, by making the mix very much wetter than customary, the concrete sets better and the mix is plastic. However, in this state it is impossible to strip out of the machine. Second, the oscillating action of the core, packs the mix against the mold-box in one direction and creates a vacuum in the opposite, causing the air to escape upward and the excess water to run down, thereby forming a compact mass which allows the block to be stripped out of the machine without slump. It is said that the machine is quiet and there is very little vibration when in operation.

## Maneuverable Truck

SALSBUURY MOTORS, Division of Avion, Inc., Los Angeles, Calif., has developed a lift truck, Model SLT, which has an articulated design which is said to give exceptional stability of load and smooth operation over ramps and ridges. While it has been designed for handling skids or racks, the lift type may be used as a cargo truck. The hydraulic hand-operated lift elevates the load 3 in. The truck may be operated at speeds up to 7 miles an hour. It will handle a capacity load of 2000 lb. up a 15 percent grade or ramp. Three lift ranges



One of two new lift trucks operated by Pacific Rock Products Co., at Roscoe, Calif.

are available: 7 in. to 10 in., 9 in. to 12 in., and 11 in. to 14 in. high.

The single cylinder, 4-cycle gasoline engine, air-cooled by fan fly-wheel, is located in the turret. Clutch, of the two-shoe type operating in a lined drum, engages automatically as engine is accelerated and disengages when engine idles. The drive wheel is 4- x 16-in., with a 3¼-in. tread.

## Vibrating Brick Machine

R. S. REED Co., Three Rivers, Mich., has announced an improved model of its Little Dave Brickmaker with a seven-brick mold box. The machine, which uses plain pallets, makes standard concrete brick, 2¼- x 3¾- x 8-in., at the rate of 12,000 units daily or 28 per minute.

The machine has a heavy-duty vibrator with controlled amplitude of vibration which is at the rate of 3600 vibrations per minute. Electrical

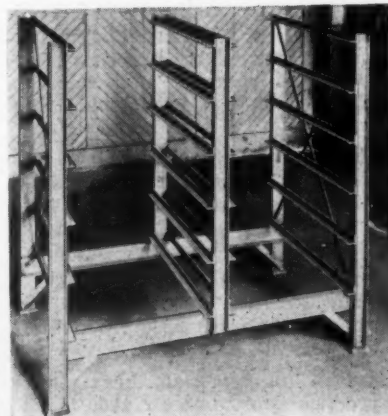


Foot-controlled, vibrating type brick machine

mechanism is totally enclosed with a built in electronic control. The molding cycle is started and stopped with a convenient foot switch. Seven different size units can be made on this machine.

## Concrete Block Rack

T. R. MOFFAT, Bethelhem, Penn., has brought out a concrete block rack constructed of corrosive-resistant and high-strength copper-bearing steel, known as Otiscoloy, supplied



Concrete block rack made of corrosive-resistant, high-strength steel sections

by Jones & Laughlin Steel Corporation. It is said to have 40 percent greater strength, lighter weight, and much more resistance to corrosion, abrasion and fatigue. The manufacturer states that this alloy steel was selected to resist the corrosive action of live steam, overloading, and the hard wear to which racks are subjected by high-speed lift and fork trucks.

## Purchase Block Plant

EARL SHADE, Erie, Penn., has purchased the block plant formerly operated by John Bernardini at 32nd and Brandes streets.

## New Concrete Products Plants

**N**EW ENTERPRISES for the manufacture of concrete products, according to regions, follow:

### Great Plains States

**AMERICAN CONCRETE BLOCK CO.**, Kansas City, Kan., which has a capacity of 240 block per hour, has just completed erection of its own building. The company is owned by L. N. Buck, his daughter, Mrs. Edna Kyle, and his son, Richard T. Buck.

**COSOCO CEMENT BLOCK WORKS**, North Platte, Neb., is a new company producing 250 units daily. Larry Cook, Ozzie Solem, and Dick Corder, all returned vets, are the owners.

**QUALITY PRODUCTS CO.**, El Dorado, Kans., has started production of concrete masonry units at the rate of 2500 per day. The company is composed of four partners: O. L. Hughes, W. N. Clark, C. A. Lewis, and Mrs. Floyd Clayton.

**CHARLEY BENEDICT AND SONS**, Hermitage, Mo., are producing 200 units per day at a new plant.

**WALTER M. MORTON and CLARK MORTON, JR.**, returned servicemen, will open a concrete block plant in Lawrence, Kan.

**RICHARD and HARRY MAAS**, brothers, St. Charles, Mo., have started a concrete block business at 703 S. Main Street.

**CHARLES A. MARTIN**, Coffeyville, Kan., has started construction of a ready-mixed concrete and concrete products plant at 605 Graphic St., including storage bins and batching hoppers.

**CONCRETE PRODUCTS CO.**, Manchester, Mo., has started the production of concrete block, brick, septic tank block, and other concrete building materials.

**GULL and BELL CONCRETE WORKS**, Olathe, Kans., has started production of concrete masonry units.

**MELVIN JOHNSON**, Elgin, Iowa, plans to produce approximately 1000 block per day in his new cement block plant. Elmer Nelson is manager of the plant.

**STAR CEMENT BLOCK CO.**, Sterling, Kan., expect to start manufacturing concrete block by June 15. Doc Lowe and W. A. Snell are co-owners and John Anderson is manager of the plant.

**STIRLING SHARP and OWEN BOSLEY**, returned veterans, are operating a concrete block plant in Trenton, Mo., with a capacity of 1000 concrete block per day, increasing to between 1600 and 2000 block later. Half block and end block are also produced.

**FAIRVIEW CONCRETE PRODUCTS CO.**, Carthage, Mo., is constructing a concrete block and ready-mixed concrete plant. Owners are F. N. Jones, W. E.

Harber, and Doyle Davis, who will serve as plant manager.

**V. V. MORRIS and R. F. JOHNSON**, discharged veterans, have opened a concrete block plant at Manhattan, Kans. Capacity is 800 block per day.

**KUGLERS, INC.**, Culbertson, Nebr., has a capacity of 3500 concrete block per day in its new plant.

**CHAS. O. NEILSON**, war veteran, and his brother, Verne Neilson, have started a concrete block plant in Lyndon, Kan.

**CARROLLTON MATERIAL CO.**, Carrollton, Mo., has been organized and will manufacture concrete block and other concrete products. Owners are Kenneth Goodnight, Alfred Ellet and Robert Haywood. Mr. Ellet will supervise operation and management of the plant.

**CONCRETE PRODUCTS CO.**, Junction City, Kan., plans to construct a new concrete block plant near Seventeenth and Monroe Streets. Owner of the plant is Otis H. Walker. Other products planned include concrete roof slabs, precast lintels and reinforced roof joists, silos and burial vaults.

**B-C CONCRETE CO.**, Osawatomie, Kans., has started production of concrete block at the rate of 1000 per day. E. H. Caylor is the operator of the company.

**ROBERT SHARP**, a returned veteran, will build a concrete block plant at Paola, Kans.

**THE CONCRETE BLOCK CO.**, Lovilia, Iowa, owned and operated by Albert Avon and Etro Pavaglio, war veterans, has a capacity of 1600 concrete block per day.

**SHERWOOD'S CONCRETE BLOCK CO.**, Marshall, Mo., is a new concern manufacturing concrete block. Sam Sherwood is the manager.

**FRAZIER CEMENT PRODUCTS CO.**, Chapman, Kans., is a new concrete masonry unit plant operated by Joseph and James Frazier.

### Eastern States

**CONCRETE BUILDING BLOCK & SUPPLY CO.**, New Bethlehem, Penn., has started production of concrete block. Capacity of the plant is 1500 block per day. Owners of the company are Ralph and Ernest Bowersox and F. J. Adams.

### Northern States

**MOBRIDGE CEMENT PRODUCTS CO.**, Mobridge, S. D., will produce 2000 block per day in its new plant. C. G. Berwald and Arthur O. Himrich are the owners. Plant is also equipped to make round-corner block and special block for window frames.

**RUSHFORD CEMENT BLOCK CO.**, Rushford, Minn., has started construction of a concrete block plant

with a capacity of 2000 to 2500 block per day. Alfred Medhaug and Thomas Foster are the owners.

**ECHO CEMENT BLOCK CO.**, Echo, Minn., is the name of a new concrete block plant with a capacity of 800 block per day. L. L. Eldred, who is the owner, will be assisted by his two sons.

**EMANUEL HELM** has started a concrete block plant in New Salem, N. D.

**CUT BANK MORTARLESS BLOCK CO.**, Cut Bank, Minn., has started manufacture of concrete block and tile. Capacity is 1000 block per day in one shift. W. A. Day is president; W. R. Bacon, vice-president; Maurice G. Foix, secretary and plant manager.

**OWEN MOORE and ALBIN MARZALEK**, war veterans, have started a concrete block plant in Bobbinsdale, Minn. The name of the company is M&M Cement Block Co.

**EDWARD J. NICHOLSON and HERB BREITZMAN**, Superior, Wis., have started manufacturing sand and gravel and cinder block at 66th St. and Tower Ave.

**ELWOOD GIBSON**, Bayport, Minn., has started to produce concrete block.

**EDWARD DEVNEY**, Northfield, Minn., is now producing concrete block. Mr. Devney is a returned veteran.

**JOHN GIBSON**, Northfield, Minn., a returned veteran, has started production of concrete masonry units.

**MAHR CONCRETE PRODUCTS**, Big Stone City, S. D., is producing 700 standard units per day, according to C. P. Mahr, owner of the new company.

**HOWARD JONES**, Webster, S. D., has started production of concrete masonry units at a new plant, operated in connection with his elevator business.

**WILLIAM P. MCGUIRE**, Eagle Bend, Minn., has started operating a concrete block plant. Capacity of the plant is 400 block per day.

**ENOCH BACHE and RODNEY MATHESSON**, Northome, Minn., have started operating a concrete block plant on Mr. Bache's farm, one-half mile west of Northome.

**MITCHELL CONCRETE PRODUCTS**, Mitchell, S. D., is a new concern owned and operated by R. E. Wentz and E. J. Schneider, both returned vets.

**BELGRADE LUMBER CO.**, Belgrade, Minn., plans to start the manufacture of concrete block.

**GILBERT THOMPSON**, Alexandria, Minn., has started production of concrete block.

**ALBERT JOHNSON** is producing concrete block on a machine of his own design at De Smet, S. D.

**ACME CEMENT BLOCK CO.**, Saginaw, Mich., is the new name of the block plant recently purchased by Russell C. Lobel and Ernest W. Gould from the William Raese Co.



## Midwestern States

**GEBESSE CEMENT PRODUCTS CO.**, Flint, Mich., has been capitalized at \$100,000 in common stock to manufacture concrete products. Incorporators are: W. A. Dodge, president, Joseph F. Barnet, vice-president, and Stanley S. Young, secretary-treasurer.

**CHARLES S. BUNCH CO., INC.**, Steubenville, Ohio, plans to increase capacity of the recently purchased Cove Valley Block and Supply Co. plant to 11,000 concrete block per day at a cost of \$50,000. Major Charles S. Bunch, owner, has just been discharged from the army.

**LANGE CONCRETE CO.**, Ironton, Ohio, has gone into production of concrete block, with a Stearns-equipped plant.

**THE EDGERTON BLOCK CO.**, Edgerton, Ohio, will produce 1600 concrete block in 8 hr. in its new plant. Fred Tomlinson and Junior Fritch are partners.

**JAMES FULKERT**, a returned veteran of Port Clinton, Ohio, has started the manufacture of block in Erie township.

**UNIVERSAL CONCRETE PIPE CO.**, has reopened its Zanesville, Ohio, plant, and will install a concrete block machine with a capacity for 6000 units daily.

**MICHIGAN CONCRETE BLOCK** manufacturers in Holland, Benton Harbor, Lansing, Flint and Saginaw recently stopped operations or were preparing to, unless immediate OPA price relief was forthcoming. The industry ceilings were based upon pre-war labor costs, half of what they are today, and has been operating at a loss.

**CLARENCE ALMROTH** and his sons Robert and William, returned veterans, are constructing a concrete block plant in Fremont, Ohio.

**MAURICE MUNGER**, Ashtabula, Ohio, has started the production of concrete block at the rate of 60 block an hour with a hand-operated machine. Both smooth side and rock faced block are made.

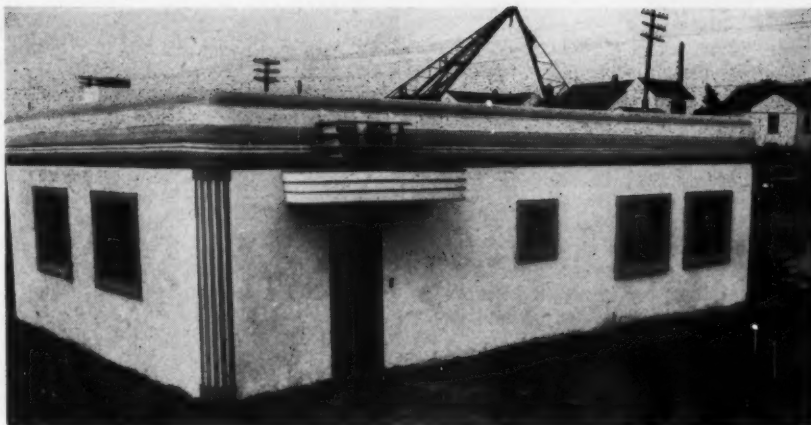
**HENRY CAVLAK** and two associates are planning to start a concrete block and concrete products plant in Cleveland, Ohio.

**A. C. MEADE CONSTRUCTION CO.**, Ashtabula, Ohio, a farm implement agency, has started a concrete block plant with a capacity of 1600 block per day.

## Southern States

**D. O. FURR**, Shreveport, La., contractor, has been issued a permit for a concrete block manufacturing plant to cost \$6,243.

**KNOXVILLE, TENN.**, manufacturers of concrete block recently protested prices to OPA officials, claiming business could not be operated with profit unless the ceiling was raised from 19 cents to 21 cents per unit.



Modernistic concrete house made with monolithically poured precast walls, roof, partition walls, and window and door openings

**E. A. HAMMER, JR.**, Shreveport, La., plans to construct a concrete block plant at 151 Finn Street.

**SOUTHERN CONCRETE PRODUCTS CO.**, Atlanta, Ga., producing 56,000 concrete brick and 9600 concrete block, is now operating in Atlanta. Hugh C. Dobbins, president, stated that the products are steam-cured and are tested for strength and absorption by one of Atlanta's recognized testing laboratories.

**JOESON MFG. CO.**, Atlanta, Ga., has started manufacturing concrete brick, block and roofing tile. Daily capacity of the plant, with two shifts, is 50,000 brick, 2000 block and 2000 roofing tile.

## Pacific Coast States

**CONCRETE SUREWAY PRODUCTS**, Bellingham, Wash., has started production of concrete block and specialties. James White, owner, stated that in addition to concrete block, pier block, stepping stones, septic tanks, and drain tile will be produced.

**ROSEBURG CONCRETE PRODUCTS CO.**, Roseburg, Ore., has erected a new plant which recently started operation. W. S. Mallory, Jr., is owner-manager.

**BUILDING PRODUCTS CO.**, Dallesport, Wash., will soon start production of pumice concrete block. Harold L. Fuller and Henry A. Allis, both of Klamath Falls, Ore., will manage the firm.

**KENT CEMENT BLOCK CO.**, Kent, Wash., Jim Biggar, owner, has started manufacture of concrete block at the rate of 1000 per day.

**DISHMAN CONCRETE PRODUCTS CO.**, Dishman, Wash., is a new concern manufacturing concrete masonry units. E. J. Shuh and R. V. Lee are the owners.

## Rocky Mountain States

**FAIRVIEW INTERLOCKING BLOCK FACTORY**, Fairview, Mont., is producing lightweight units using pumice as an

(Continued on page 139)

## Precast Concrete House

**PLASTIC ROCK INDUSTRIES CO.**, Ponca City, Okla., has announced through Wilbur V. Myer that it has developed a new method of house construction, using ready mixed concrete and monolithically cast wall, roof, floor, partition walls and porch sections. As explained by Mr. Myers, about 146 tons of concrete and six tons of steel are used in a five-room house, 20 x 32½ ft., including four rooms and a bath.

With this construction, the tilt-up principle is employed in reverse. Edge molds of steel are laid on the ground or in a factory on a casting floor. About 2 in. of fine sand is then placed within the mold and leveled. Window and door forms are fixed in place within the overall mold frame. Native stone or rock is laid into this sand face down, and tile, brick or other trim which might be used to decorate the stone also is placed in position. The entire wall is then poured with mortar which is backed up with concrete to a thickness of 8 in. Steel reinforcing framing or the "ribs" are then placed in the wet mix which is thoroughly vibrated.

Extending out of this mass of wet concrete about 3 in. are steel stirrups which are used to tie the inner and outer walls together. A 2-in. sand core is run, the steel mesh wire is tied to these stirrups, and the inner or plaster coat is poured.

When thoroughly hardened, the entire wall is tilted up by a crane, and the sand core washed out, leaving an insulating dead air space. Partition walls that are to support the roof are 6 in. thick, and have their own foundation as part of the wall.

Mr. Myers estimates that a five room house, including partition walls, floors, roof, a 6-ft. circular fire-place poured in the wall, windows and doors, with tubing and boxes in place for electrical wiring will cost about \$2000 in the average community. This price does not include floor coverings, plumbing, electrical wiring or fixtures, kitchen cabinets or heating units.



## Floor Slabs

(Continued from page 129)

The plant will be heated in the winter with a steam boiler to be installed. Jet sprays will be installed for proper curing.

Demand for the roof and floor slabs is coming from many sources. Farmers are finding the Waylite concrete slabs particularly desirable for floors and roofs in dairy and cattle barns as there is no condensation, and the barns are warmer. Stores, residences and factories also are using them in large volume.

A complete set of blueprints is available to contractors, builders, and



Steel roller conveyors transport special block from storage yard to concrete floors where roof and floor slabs are assembled, reinforcing rods placed, and grouting completes the units.



## "ANCHOR"

### Complete EQUIPMENT AND ENGINEERING SERVICE

Equipment for all phases of manufacturing concrete cinder block and other lightweight aggregate units. Our engineering service for new plants and modernizing old ones will help you operate more economically.

Stearns Clipper Stripper Machines;  
Stearns Joltcrete Machines; Stearns  
Mixers; Cast Iron and Press Steel  
pallets. Straublox Oscillating At-  
tachments, etc.

Repair parts for: Anchor, Stearns,  
Blystone Mixers and many others.

**Anchor Concrete Mch. Co.**

1191 Fairview Ave., Columbus 8, Ohio

architects showing in detail the construction with these slabs of headers, windows, trimmer beam, stair openings, electrical outlets, etc.

The company is licensing other producers to manufacture the floor and roof system. It is of interest to note that the floor system takes its name from B. Vander Heyden, son of the company's president and in charge of the concrete block plant, who developed the system. He is familiarly known by his nickname "Doc" throughout the industry.

## Precast Concrete House

WILLIAM M. WILSON, Los Angeles, Calif., has announced the Wilson System of constructing prefabricated concrete sectional building units for small homes, garages, farm buildings, and "motels." Forms for the precast sections are of two designs and two wall thicknesses; 4½-in. and 6-in. walls in design No. 1, with oval projections to provide grout holes on cast sections; and design No. 2 with a flat face for square edges, door openings, cast in place columns or corners, jack or plate installation.

## Alpha Ups Sacked Cement

ALPHA PORTLAND CEMENT Co., Easton, Penn., has announced an increase of 5c a bbl. on cement when packed in paper containers, effective August 10. The price of bulk cement was not changed. The increase in bag-packed cement is to compensate the company for the loss which it has been absorbing in the higher cost of the bags. The company also announced an increase in the leasing price of cotton sacks from 10c to 25c to protect it against the increased cost of these sacks. Frequently the sacks are not returned.

## Enlarge Plant

MAJESTIC BUILDING MATERIALS CORPORATION, St. Louis, Mo., is modernizing and enlarging its present plant with the installation of a Johnson bulk cement system, a Besser Super Vibrapac to augment the one now in operation, and a Stearns Warren Yardhoist. New curing rooms are being built to increase block curing capacity to 15,000 units, tripling the old capacity. The modernization program will be completed by late Fall.

## Products Plant Fire

INLAND EMPIRE CONCRETE PRODUCTS Co., Moscow, Idaho, recently suffered a fire loss of \$12,000 to plant, machinery, and stores of cement. Fred H. Simpkin and L. F. McCarty, owners, reported that some of the machinery can be salvaged.

## Sell Block Plant

DIETERMAN BROTHERS, Kalamazoo, Mich., recently sold their concrete products plant to John Oosterbaan and Philip Valle. Otto and Frank Dieterman with another brother founded the business 25 years ago. The company hereafter will be known as the Cement Block Manufacturing Company.

## FARREL-BACON

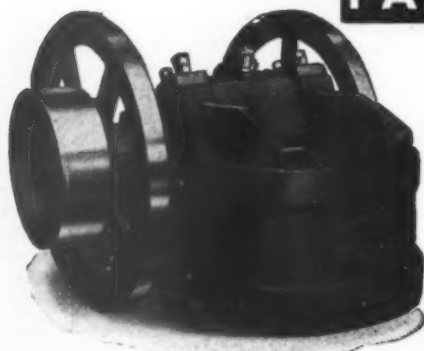
### CRUSHERS

Complete plants designed and equipped, including Screens, Elevators and Conveyors. Machinery for Mines and Rock Quarries, Sand and Gravel Plants.

Engineering Service

**FARREL-BACON**

ANSONIA, CONN.



# Super VIBRATOR CONCRETE BLOCK MACHINE

● Consistent production of High Compressive Strength masonry units are the GEORGE SUPER VIBRATOR'S answer to today's building material requirements.

● Dual Vibration — THE CORES VIBRATE on their own Vibrating mechanism—the MOLD BOX vibrates on its OWN MECHANISM — BOTH Vibrations are SYNCHRONIZED to make better blocks—FASTER.

● Independent Mold Box and Core Mounting on Neoprene Absorbers assures Maximum Isolation of vibration, resulting in Minimum Frame Fatigue.

● ADD to this the new PRESS PACK—new standard equipment on all GEORGE SUPER VIBRATORS—resulting blocks are 20% to 30% more dense.

● At Machine Capacity of 300 BLOCKS PER HOUR top quality production can be maintained.

● Sturdy, Rugged, skillfully Engineered Design assures LOW MAINTENANCE COST.

● George Super V CONCRETE BLOCK MACHINES, conveyors, mixers and pallets are honestly built for Efficiency, Economy, Dependability. They meet manufacturers' and users' strictest requirements.

**CAPACITY**  
**300**  
**BLOCKS**  
**PER HOUR**



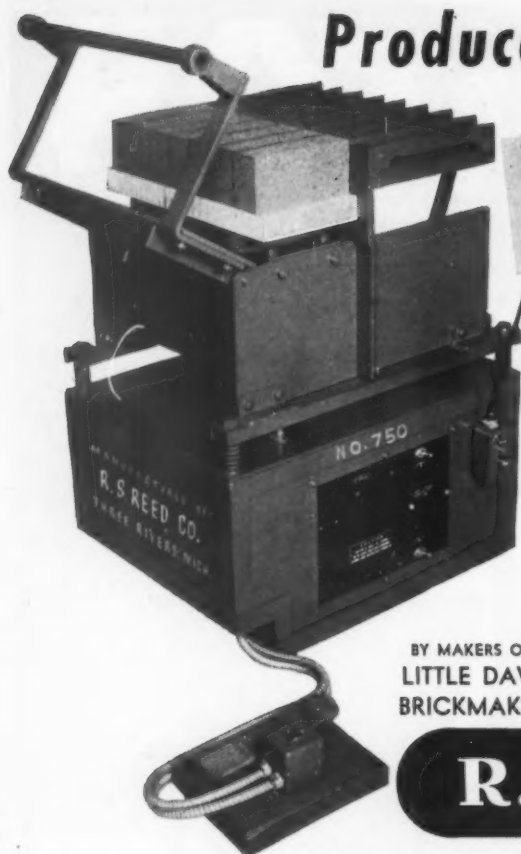
**GEORGE**  
**SUPER**  
**V**

**F·C·GEORGE MACHINE CO.**

**ORLANDO**

*100 S. Westmoreland Drive*

**FLORIDA**



**Produces 28 Bricks Per Minute!**

**VI-BRIK-CRETE**  
A VIBRATING MACHINE THAT MAKES BETTER CONCRETE PRODUCTS

**BETTER, LOW COST CONCRETE BRICKS**

The designing-engineers of the widely accepted LITTLE DAVE BRICKMAKER offer the new, semi-automatic, low cost VI-BRIK-CRETE to those who wish to make handsome profits in the concrete products field.

The VI-BRIK-CRETE employs the principle of selective vibration thus assuring the operator of a better brick at a very high rate of production (12,000 standard size brick daily output). Concrete brick are being sold in most locations at \$30.00 per thousand.

All steel construction, built in electronic controls, low power consumption, totally enclosed electrical controls, no carry over on stop and start plus ease and simplicity of operation make VI-BRIK-CRETE the outstanding value in the brick making field.

BY MAKERS OF  
LITTLE DAVE  
BRICKMAKER

WRITE OR WIRE FOR FREE ILLUSTRATED FOLDER

MANUFACTURED BY

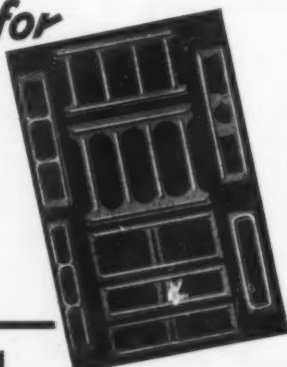
**R.S. Reed Corporation**

325 EAST MICHIGAN AVENUE • THREE RIVERS, MICHIGAN

**VITAL for**

**MAKING  
PERFECTLY  
FORMED  
CONCRETE  
BLOCK**

**COMMERCIAL  
CORED STEEL  
PALLET**



**The "Backbone"  
of Concrete  
Block Production**

The pallets you use can mean the difference between just possible and high-quality concrete block. When you use COMMERCIAL Steel Pallets you can be absolutely sure of getting perfectly formed, sharp-edged block. Furthermore, COMMERCIAL Steel Pallets assure more uniform and quicker curing of the green units, maximum rock and maximum kiln capacity. The ribs pressed into COMMERCIAL Steel Pallets impart both strength and mortar grooves into the bottom of the concrete block. Lightweight, indestructible and warp-proof, COMMERCIAL Steel Pallets are the backbone of high quality block production.

Write today for a catalog

**The COMMERCIAL SHEARING &  
STAMPING COMPANY**  
YOUNGSTOWN, OHIO.

**Hydromatic LIFT TRUCKS**



**Speed  
Handling**  
•  
**Reduce  
Breakage**  
•

Many concrete products manufacturers have cut handling costs by using the Hydromatic. This lift truck has a new type ram, easy rolling ball-bearing wheels, and automatic lifting engagement and automatic release . . . insuring speedy and safe handling of loads up to 8000 lbs. The Hydromatic is a multiple stroke, all steel constructed truck, with parts standardized and interchangeable for low cost operation. Write for detailed information and Folder "J."

**The Red Arrow  
The Hydromatic**  
Easy single or multi-stroke hand lift truck. Capacities up to 8000 lbs. Users state they pay for themselves 5 to 10 times yearly.



**LIFT TRUCKS, INC.**

Walter Stuebing, President  
2425 Spring Grove Ave. Cincinnati 14, Ohio



(Continued from page 135)

aggregate. Production capacity is about 1400 block per day, according to Harold Dahl, owner.

DEWEY TAFT'S ENTERPRISES, UNINCORPORATED, Englewood, Colo., is the name of a new plant producing concrete block and brick. Present capacity is 30,000 brick per month but the plant will expand as soon as more equipment can be obtained.

### Sand Company Makes Concrete Block

PIONEER SAND Co., St. Louis, Mo., has built a concrete block plant at its sand plant on the Missouri River. Equipment includes a Besser Super-Vibrapac, six steam-curing rooms, 34 ft. long, 13 ft. wide, and 8 ft. high, and a four-compartment Butler aggregate and cement bin. Aggregates are moved to the bin by a bucket elevator rated at a capacity of 47.9 cu. yds. per hour. Three of the four compartments, with capacities of 40, 51.5 and 47.5 cu. yds., are for aggregates while the fourth compartment, with a capacity of 69 cu. yd. (414 to 465 bbls.), is for bulk cement. The bin is equipped with steam jets projecting into the aggregate compartments for cold weather operation, as well as an electric signal to tell when the compartments are full. Also included in the plant equipment are a 50-cu. yd. batch mixer; a Model 240 Trident Auto-Stop water meter; and an Erickson fork-type lift truck with a 5000-lb. capacity. Production capacity is 5000 units per day.

### Rounding Out Production

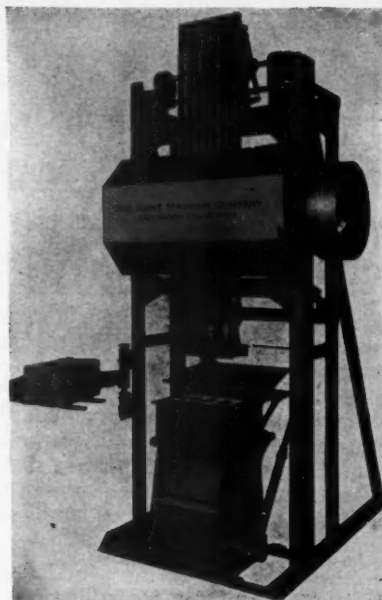
SUPERIOR PRODUCTS Co., Detroit, Mich., recently called attention to a news item appearing on page 140 of the February issue of Rock Products concerning this company's new plant located at the old Escanaba, Mich., airport. C. F. Meanwell, vice-president, points out that prior to the war the company did have a plant at Wells, Mich., which is just outside Escanaba, but due to the uncertain prospects at that time for concrete pipe in the area, operations were discontinued. The building at the old airport site and the addition of curing rooms will provide a layout which will allow more storage room for pipe. Mr. Meanwell also advises that a block machine has been set up in addition to pipe machinery which, due to the limited demand for concrete pipe in this area, will permit a more continuous operation. Pipe will be made in sizes from 6 in. to 84 in. diameter.

### Resume Cement Production

THE NORTH AMERICAN CEMENT CORPORATION, Howes Cave, N. Y., plant will soon be in full production for the first time since 1942. The company stopped cement production at this plant shortly after the outbreak of the war.

# KENT-

a  
name  
identified  
with  
advanced  
CONCRETE  
PRODUCTS  
MACHINERY



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Since  
1925  
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Write for literature describing the following products  
or complete plants for small or large volume production!

- KENT Tampers
- KENT Strippers
- KENT Feeders and Elevators
- KENT Batch Mixers
- KENT Continuous Mixers
- KENT Aggregate Elevators
- KENT Pallets and Pallet Dunkers
- KENT Steel Racks
- KENT Lift Trucks
- KENT Complete Plants

..

Free consultation is available regarding planning of new  
plants or modernizing of your present layout.

...

## The Kent Machine Co.

117 East Portage Trail

Cuyahoga Falls, Ohio



## TO MY FRIENDS IN THE CONCRETE MASONRY INDUSTRY:

Temptation to relax strict adherence to standard specifications on block was never greater than at present. But we must remember that the growth of our industry was due to the work of leaders who set up high standards of quality for concrete masonry and worked religiously for a quarter of a century to maintain those high standards. Now the future of the concrete masonry industry is in our hands and we must maintain quality at all costs.

About the first of the year I found that the heavy demand for block had wiped out our stockpile and there was no let up in demand to permit us to build up an inventory.

Drastic action was necessary. We refused for two weeks to furnish block to any customer in order to build up a good inventory of quality block. We operated our plant at capacity, enlarged our covered storage facilities and stockpiled some 400,000 block. These block were high temperature cured, dried and kept under cover.

At the end of two weeks we started filling orders with block two weeks old and sold every day only the number of block we could make and return to stock. Five block selected from stockpiles are tested every week for compression, absorption and moisture content. We will continue the practice of maintaining at least a two weeks supply of standard quality, dry block on hand at all times.

When we took this drastic action some of our people feared our contractor customers would leave us because of our refusal to deliver green block. But that did not happen. A majority complimented us on our stand.

**JAY C. EHLE**  
Cleveland Builders Supply Co.

The foregoing message from Jay Ehle of the Cleveland Builders Supply Co. states clearly his company's policy and the heroic action taken to maintain quality. Other messages from leaders in the concrete masonry industry giving practical, down-to-earth suggestions about maintaining quality under present conditions will be published in subsequent issues.

## PORTLAND CEMENT ASSOCIATION

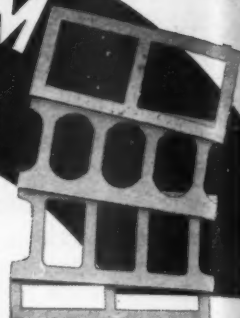
Dept. 9-45, 33 W. Grand Ave., Chicago 10, Illinois

A national organization to improve and extend the uses of concrete  
... through scientific research and engineering field work

## ALUMINUM PALLET

### NOW

is the time to insist on V-LINE PALLETS for your new block machine.



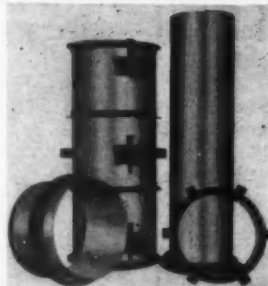
Nearly all block plants would like to have a really satisfactory aluminum pallet; due to ease of handling, less block breakage, lower shipping costs, etc. V-LINE pallets in many sizes sell for less than iron pallets, yet always retain 30% of original value in aluminum.

Wide and enthusiastic acceptance of this super-strength pallet by the industry, plus our expanded mass production facilities, have kept cost down and deliveries up. Write, wire or phone for new price list now!

## FLORIDA DIE CASTING FOUNDRY

PHONE 2-1838 • ORLANDO, FLORIDA

## ATLAS Concrete Pipe Forms



Typical Atlas Concrete Pipe Form. No clamps, hooks or gadgets to get out of order.

YOU SAVE Time and Money with ATLAS CONCRETE PIPE FORMS because you can count on them to stand up under hard usage, hold their shape and turn out high grade pipe over a long period of time... pipe which is smooth, round and true with joints that fit accurately together.

Operation is speedy both in setting up, filling and removal of pipe. Write for complete facts. Ask for illustrated bulletin.

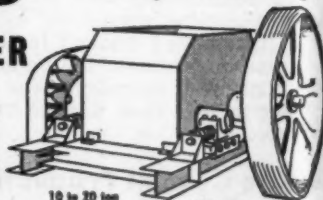
**ATLAS STEEL  
CONSTRUCTION CO.**

IRVINGTON 17 NEW YORK

There's an ATLAS STEEL FORM for Every Purpose

## BONDED 7 Days Delivery CINDER CRUSHER

The crushers of low operating and maintenance costs. Gives complete, efficient crushing in ONE operation for block making. Hundreds of satisfied users in the U.S. and Canada. Write, or phone GARFIELD 5712 for free descriptive folder.



10 to 30 ton  
per hr. Cap.

25 to 50 ton  
per hr. Cap.

**\$345.**

**\$795.**

## BONDED SCALE COMPANY

MANUFACTURERS OF SCALES, CRUSHERS, CONVEYORS, VIBRATING SCREENS

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## Step Up Production Versatility Plus Means more profit from your **CONCRETE BLOCK MACHINES**

The Graveley "Better Built" concrete block machine is your answer to greater returns per man hour of work. This rugged all way machine makes scores of sizes and styles of blocks. Such versatile performance of a simplified "Better Built" machine allows you to offer a complete line, plus the stepped up production possible only with a Graveley "Better Built."

Versatility, plus greater production, means greater profits to you. One unit only will produce for you 1600 blocks or more in an 8-hour day; a two machine unit operating from one mixer and conveyor will produce for you over 3200 blocks a day.

Modern assembly line production methods, plus exclusive Graveley patents, produce for you a better machine at a lower investment.

Immediate delivery is now possible. Write, wire or phone today. Put a Graveley to work for you without delay.

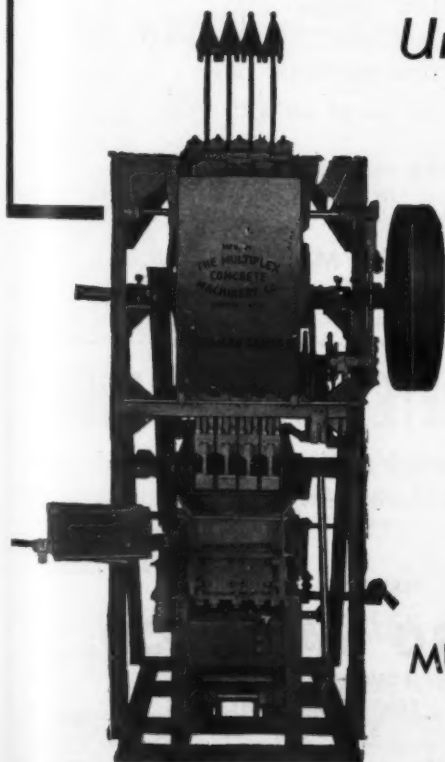
**GRAVELEY**  **MACHINERY**

**BOB GRAVELEY INDUSTRIES  
INC.**  
Orlando, Florida

Expert Agents—Southeast Steel Sales Co.  
Orlando, Florida, U. S. A.

**A LOW PRICED UNIT THAT IS A REAL PROFIT MAKER**

## Universal Type **MULTIPLEX STANDARD TAMPER**



"Old Reliable" itself, this economical machine which produces three to four 8" x 8" x 16" blocks of uniform high quality every minute day after day with minimum maintenance.

It may be purchased as a hand-operated stripper and strike-off machine which can be converted into a power-operated, semi-automatic machine later. It is supplied with either 4 or 8 tamping bars. Write for complete catalog today!

**MULTIPLEX CONCRETE MACHINERY COMPANY**  
ELMORE, OHIO

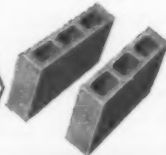
*Specializing in Satisfactory Service Since 1906*



## EDGAR VIBRA-SHAKER BLOCK MACHINE



TWO  
PERFECT  
PARTITION  
BLOCKS  
IN ONE  
OPERATION



The EDGAR Vibra-Shaker Block Machine is a sturdily constructed unit built for long service and low operating cost. All moving parts are pressure lubricated, easily accessible.

A special feature of the EDGAR Vibra-Shaker Block Machine is the partition change-over for making TWO 4 x 8 x 16 concrete blocks in a single operation—each block accurately sized and uniformly textured with sharp, even corners.

Capacity—1400 blocks per day.

Price **\$900**  
with partition change-over

Machine and pallets shipped within two weeks of order.

EDGAR'S BLOCK MACHINE WORKS  
ORMOND • FLORIDA

## TYRA BRICKMAKER

Makes Concrete Brick and Solid Blocks. Portable. Hand Tamped.

## TYRA CONCRETE MIXER

Hand and Power Operated. Built for the concrete products industry.

## TYRA BLOCKMAKER

Makes Cored Blocks. Portable. Hand and Power Tamped.

QUICK DELIVERIES

R. K. TYRA CORP. WYOMING MINN.

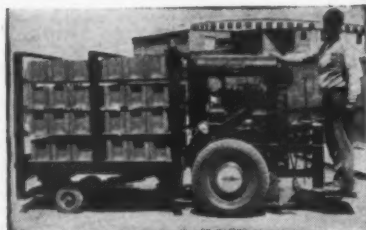
## ERICKSON POWER LIFT TRUCKS

STAMINA

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Pneumatic tired, low and high lift fork trucks—platform trucks.



No paved runways needed—Speedy hydraulic platform raiser—Simple controls. Write for complete details.

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- ★ No. 12 BLATT MIXER
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BLOCK MACHINE (Single) \$700

BLOCK MACHINE (Double) \$900

BRICK MACHINE (12 at a time) \$700

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**FREE** WEEK'S FREE TRAINING  
IN OUR PLANT WITH NO OBLIGATION

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## CONCRETE BURIAL VAULTS

America's Finest Molds and  
Lowering Device

TERRITORY FRANCHISES

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EQUIPMENT DIVISION  
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# PROFIT POINTERS for Concrete Block Makers!

**Built to  
Last**

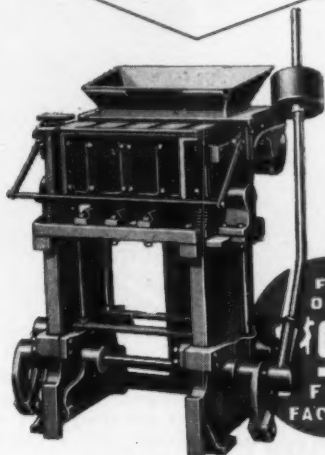
**APPLEY  
"Little Giant"  
Vibrator**

**8 Block  
Sizes**

The APPLEY "LITTLE GIANT" Vibrator's compact, rugged construction survives the challenge of hard, every-hour production.

Precision machining and expert assembly guarantee smooth, easy, LOW-COST action and speedy production. The "LITTLE GIANT" turns out from 100 to 120 large 8"x8"x16" blocks per hour, frequently more.

The "LITTLE GIANT" is the logical, ideal machine to buy NOW as permanent replacement for old machines frayed and broken in the war-time rush. The "LITTLE GIANT" does away with waste—it's a PROFIT-PRODUCER!



FOR  
ONLY  
**\$995.**  
FOR  
FACTORY

Eight sizes of blocks are moulded day after day in this profit-producing machine. Its mould box forms perfect, uniform-density-blocks with an action of SIX THOUSAND MECHANICAL VIBRATIONS PER MINUTE. Vibrating mould box and stationary, interchangeable cores assure perfectly cut, smoothly faced blocks. Block size change-over is simple, quick.

Precision made, the "LITTLE GIANT" is of cast iron and steel; has absolute minimum of wearing parts. Mould box lined with manganese steel to balk abrasion. Minimum time loss, too, from changing parts, cores.

**PROMPT**

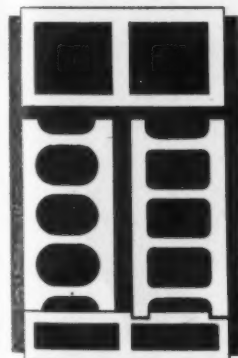
**J. W. APPLEY & SON, Inc.**

**DELIVERY**

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## "GUARANTEED" ALUMINUM-COPPER PALLETS"



Pallets for all machines in two and three cell. If our pallet breaks from abusive use, return the aluminum-copper and we will replace the pallet for cost of labor on a new one, 30c.

Special pallets made to order, send drawing or sample at once.

Pallets for making 8 x 8 x 16 blocks two and three cell available for immediate delivery.

Pallets for making partition blocks two and three cell available for immediate delivery.

**INCREASE YOUR PRODUCTION BY USING  
GUARANTEED "WELL-BUILT" ALUMINUM-  
COPPER PALLETS**

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Exclusive Export Distributor of Gravelley "Better-Built" Block Machinery

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**THE LEADING MANUFACTURER OF  
LIFT TRUCK RACKS AND BLOCK CARS  
for the Concrete Products Industry**



• Style 293 Hinged Deck Block Cars in service at the Edmonds Art Stone Company, Washington, D. C.

**ANY STYLE OR DESIGN LIFT TRUCK RACK  
OR CAR FOR YOUR PLANT**

**THE CHASE FOUNDRY & MANUFACTURING CO.**

COLUMBUS 7, OHIO

# TEN MEN SAVED!



## WHEN THIS DIXIE NON-CLOG HAMMERMILL WENT TO WORK

The necessity for extra men at the feed hopper was eliminated—the time of 10 men saved—when a cement plant\* installed a DIXIE Non-Clog Hammermill with its patented Movable Breaker Plate . . . an exclusive Dixie feature.

With a DIXIE the company found it could handle the wettest, stickiest material, direct from the quarry, without slowing down production or clogging the feed.

This is but one of many case histories that demonstrate the ability of a DIXIE to cut costs, increase output, minimize shutdowns.

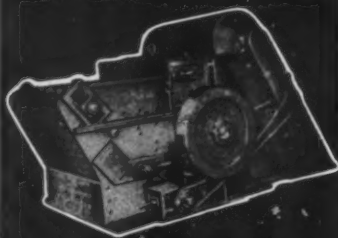
\*Name on request

Send for your copy of free  
booklet—"More Efficient  
Crushing of Raw Materials."

## DIXIE

MACHINERY MFG. CO.  
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# DIXIE

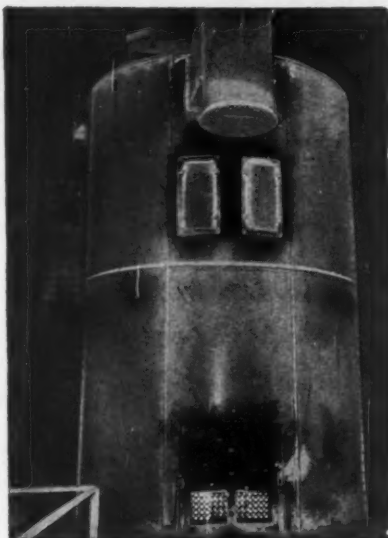


## HAMMERMILLS

for

CRUSHING • GRINDING  
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Above is pictured the 17-ton Ehrsam calcining kettle, standard for the industry

EHR SAM manufactures a complete line of equipment for making gypsum wallboard and for processing many other non-metallic materials.

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## Centrifugal Air Separator



The features embodied in the new model GAYCO Centrifugal Air Separator make them a leading means of increasing the capacity and efficiency of all types of grinding mills. They have quick, positive adjustment. When once adjusted they are not affected by variation in speed or rate of feed.

They require very little power to operate. And they feature the exclusive GAYCO principle of rejecting coarse particles by means of a centrifugal sizing fan. They separate 99% through 325 mesh, and give 35% to 30% greater recovery of fines.

Manufacturers also of "Bellance" Crushers, Screens, Elevators, Conveyors, Bin Gates, Grizzlies. Complete crushing, screening, and washing plants for crushed stone, sand and gravel.

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Using the Meckum Steel Sectional Dredge Hull

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*complete hydraulic*

# DREDGES

"ENGINEERED TO YOUR NEEDS"

CONVERSIONS  
REPLACEMENTS  
REPAIR PARTS

WE HAVE WHATEVER YOU NEED  
FOR YOUR DREDGE

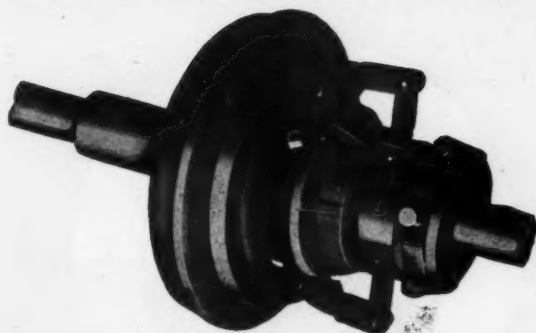
Dredge Pumps  
Portable Hulls Chain Cutters  
Rubber Hose and Sleeves  
Hoists Dredge Pipe



**MECKUM**  
ENGINEERING, Inc.

DREDGING EQUIPMENT  
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JONES-LEMLEY friction clutches are built for a broad range of shaft sizes and ratings in both enclosed and open types for sleeve and coupling work. In addition they are available in a line of Jones-Lemley friction clutch

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HERRINGBONE—WORM—SPUR—GEAR SPEED REDUCERS • PULLEYS  
CUT AND MOLDED TOOTH GEARS • V-BELT SHEAVES • ANTI-FRICTION  
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## for Transmission and Conveyor Service



Close grained Meehanite iron used in these Pulleys provides exceptional strength and durability.

Complete range of sizes in solid, split or clamp-hub construction for every type of service. Special features are available, such as inside and outside rim flanges, offset and longer-than-standard hubs, special face widths and bores, cone faces, jaw clutch, friction clutch or breaking pin hubs.

Send your inquiries to our nearest District Office

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ATLANTA

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## BLAW-KNOX BUCKETS



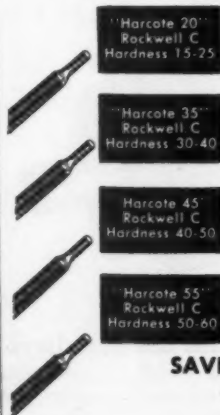
Write Bucket Headquarters

Whatever the job, Blaw-Knox provides a bucket that gets more work done with less crane time. . . . Over 100 types and sizes! Write for Catalog 1757.

**BLAW-KNOX DIVISION of Blaw-Knox Company**

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## NOW! P&H Hard-Facing Electrodes To Match Desired Rockwell "C" Hardness



**P&H** now makes hard surfacing a simpler, easier job — easier in the selection of the correct electrode . . . easier to get the desired as-welded hardness.

These four new P&H "Harcote" Electrodes do it! For now Harcote is available in a type having the exact degree of Rockwell C hardness for the job. If the job calls for a Rockwell C hardness of 55 — just order and use Harcote "55". That's all there is to it! No guess work — no confusion. Simply specify "Harcote" according to the corresponding number of Rockwell "C" hardness desired.

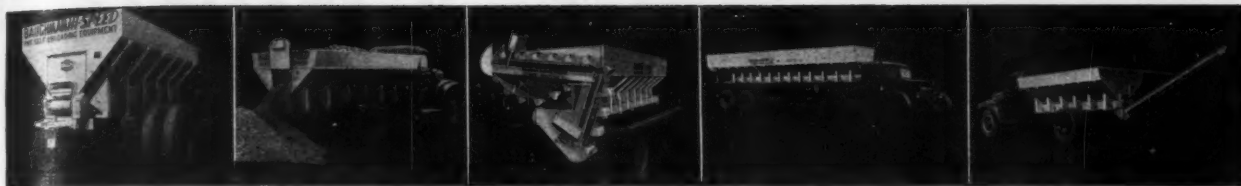
**SAVE TIME — SAVE EQUIPMENT  
— USE P&H HARCOTE**

Call Your P&H Representative or write for complete information on Harcote. A complete line of other P&H electrodes is also available.

**P & H**

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Special  
"Steep Side" Body

Steel Conveyor "with Belt"  
Unloading Rack

Model J Side Conveyor  
or Transfer Attachment

Motor Driven  
Semi-Trailer Body

Model T Rear Conveyor  
or Transfer Attachment

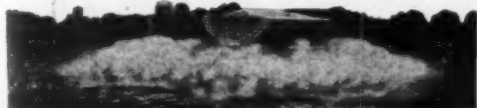
## The New Baughman "Self-Unloading" Body is VERSATILE and RUGGED!

Baughman's New Model ASK-2 "Self-Unloading" Body is versatile—spreads lime, dumps rocks, delivers coal into bins, grain into cribs, or transfers its load to another vehicle.

Rugged—one standard body design capable of doing many specialized trucking jobs.

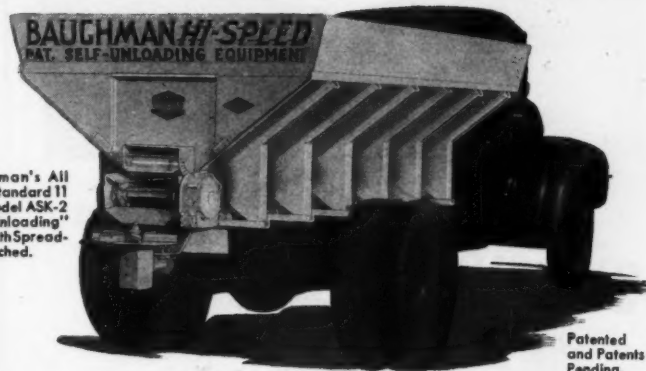
Constructed of high tensile, alloy steel (30% lighter, 17% stronger, and more abrasive resistant than ordinary steel). Ball and roller bearings throughout. Made in either Standard or Steep Sides—Lengths to suit your truck—Power take-off or motor driven—With or without attachments.

Ask for recommendations—we have a reliable dealer near you.

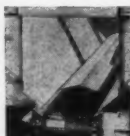


manufactured exclusively by  
**BAUGHMAN MANUFACTURING CO., Inc.**  
Factories • JERSEYVILLE, ILLINOIS  
Manufacturers of the famous "Hi-Speed" line of Self-Unloading Equipment.

Baughman's All  
Steel, Standard 11  
foot Model ASK-2  
"Self-Unloading"  
Body with Spread-  
er Attached.



Patented  
and Patents  
Pending.



View of our heavy  
cut steel and  
bronze, 15 to 1,  
Gear Reduction.  
Simple, efficient,  
trouble-free. Will  
give years of  
service.

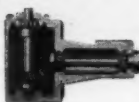


View of our  
Distributor  
Case. Heavy,  
hardened and  
annealed cut  
steel gears.



Model O Phosphate and  
Powdered Lime Spreader Attachment.

Cut-away view of our  
steel drag-chain with  
belt attached. Also  
note new type, ad-  
justable, feed-choker.



*Welded Construction*  
**MAKES A BIG DIFFERENCE...**

# WELLMAN

*Williams Type* **BUCKETS**

- Wellman leads the field in welded bucket construction. Wellman improved design means *better service, lower cost for you!* A type for every purpose: Multiple Rope, Power Arm, Dragline, Power Wheel, Special Service;  $\frac{3}{8}$  to 16½-yd. capacity.

**SEND FOR BULLETIN**

**THE WELLMAN ENGINEERING COMPANY**

7023 CENTRAL AVENUE • CLEVELAND 4, OHIO



Dragline



Multiple  
Rope



Power Arm





**HAMMOND**  
MULTI-WALL  
**BAGS**

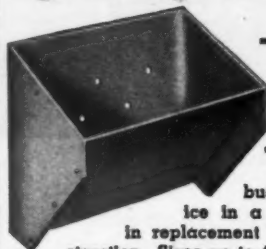
Your products are safely protected against the elements and rough handling when shipped in HAMMOND Multi-Wall Bags.

**HAMMOND BAG & PAPER COMPANY**  
Paper Mill and Factory: WELLSBURG, W. VA.

## Specify STANDARD

when you need

## ELEVATOR BUCKETS

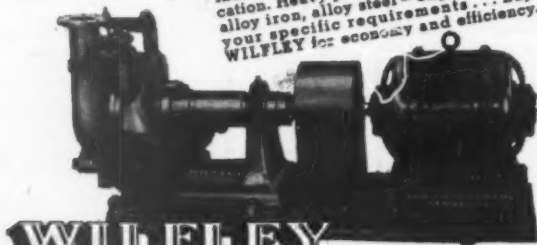


Standard designs or special buckets to your order. Skilled service in a well-equipped plant specializing in replacement buckets. Welded or riveted construction. Sizes up to 42" long, 1/4" steel. Large or small orders given prompt and individual attention. Write for our low prices.

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**PERFORATED METAL  
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Any size or style screen, in thickness of steel wanted with any size perforation desired.

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## McLANAHAN *All Steel* ROCKMASTER CRUSHERS

with Hopper Removed

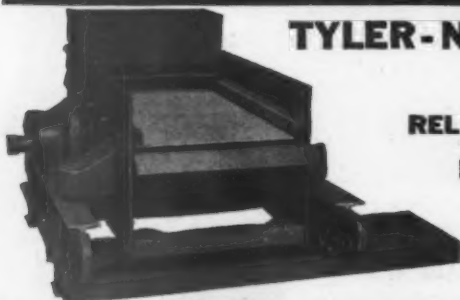
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2' x 4' Type 100  
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Screen

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**RELIABLE**  
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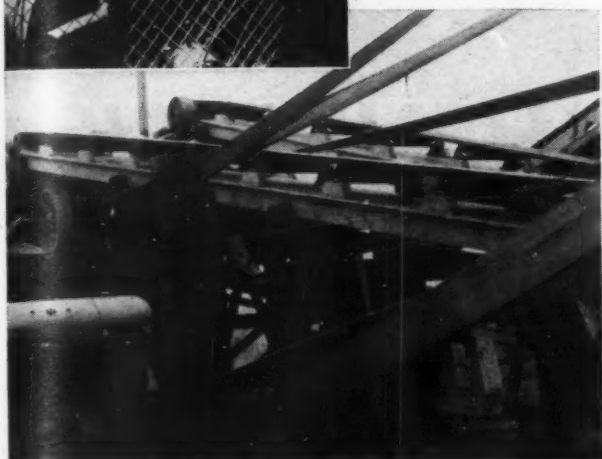
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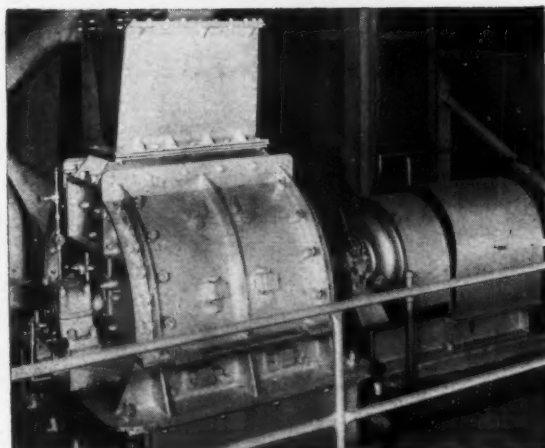
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SINGLE ROLL CRUSHERS are specialized for small Primary reductions and heavy duty Secondary reductions of Cement-making materials, Limestone, Gypsum, Industrial Minerals, Ores, etc.

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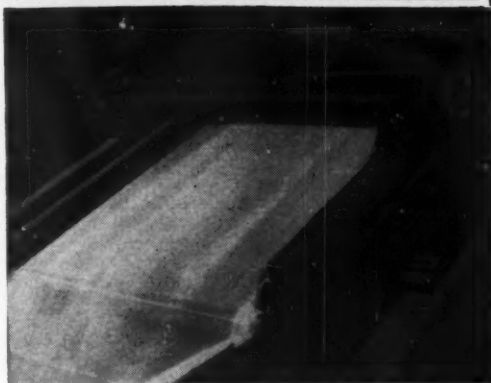
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Made in a number of standard sizes — single or multiple decks, with or without enclosures.

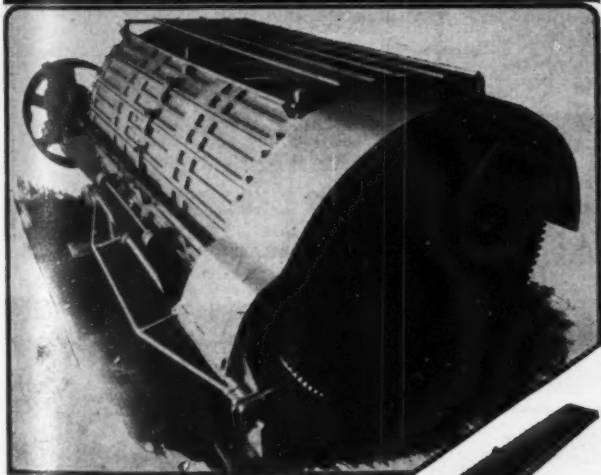


You can depend on Link-Belt screens to do just that kind of a job. In their design, we give you the benefit of our wide experience in solving all kinds of screening applications. Made in a number of standard sizes. Get Link-Belt Screens and keep production up!

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**PATENTED INTERCHANGEABLE STAVES** are concave shaped and bolt to the drum ends to form the mixing drum. When any part of the drum becomes worn, it is easy to interchange one stave with another and proceed with the mixing. No outside drum or interliners required.

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## MOBILE AIR POWER for Low-Cost Drilling



Out where new drilling begins, operators are often finding that the quick, economical way to get there is with Jaeger air-cooled portable compressors. Their rugged, modern trailer mounting (structurally welded frame, spring suspension, Timken bearings, Big pneumatic tires, automotive steering) safely takes them wherever trucks can travel. Provides mobility and flexibility of air supply with a range of sizes up to 500 cu. ft. of free air per minute (ample for two wagon drills, as many as 9 rock drills), delivered at cooler temperatures and less cost for fuel and upkeep than you have ever thought possible.

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Latest Caterpillar, International and Continental engines supply dependable power. Sold and serviced in over 100 cities. Send for Catalog JC-5.

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MACHINERY, TRUCK MIXERS — DISTRIBUTORS IN 120 CITIES

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- 1—25 ton Ohio Mdl. B. Ser. No. 3722, steam powered, 50' boom.
- 1—25 ton Browning No. 8, Ser. No. 1734, steam powered, 42' boom.

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Portable and stationary, belt with elec. or gas power, sizes from 20 cu. ft. 1,000 cu. ft.

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- 1—Acme Style D 25% Jaw Crusher, with screen, elevator and gas eng., 12 to 18 tons per hour.
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- 1—12x20" Acme Road Machinery's Jaw Crusher, Ser. No. 1273, Style A.
- 1—9x16" Climax Jaw Crusher #22.
- 1—9x16" Acme Jaw Crusher #1686, size 8 1/2 A.
- 1—9x18" Sawyer Massey Jaw Crusher.
- 1—25 Allis Chalmers Gyratory Crusher, No. 5331, size 10x38".
- 1—25 Austin Gyratory Crusher, Ser. No. 2945, size 12x36 1/2".

### DERRICKS

- 4—Steel guy derricks, 2—20 ton American steel guy derricks, 110' masts, 99-100' booms. 1—15 ton American steel derrick, 83' mast, 75' boom. 1—5 ton Terry Guy Derrick, 70' mast, 60' boom.
- 18—Stiffleg derricks. 1—63 1/2 ton Inaley, 54' mast, 70' boom. 18—30 ton BRAND NEW Wiley Derricks, 30' masts, 60' booms. 1—15 ton All Steel derrick, 25' mast, 90' boom.

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CORPORATION  
of AMERICA.**

We start out in reverse by disassembling equipment. Then we reassemble it from ground up; replacing all worn parts with new ones.

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- 85—Electric, ranging from 30 H.P. up to 125 H.P. consisting of triple-drum, double-drum and single drum, with AC or DC motors, some with attached swingers. Following makes: American, Clyde, Lambert, Lidgerwood and National.
- Gas hoists ranging from 8 to 120 H.P., single, double and triple-drum all standard makes (38 in stock).
- Steam, ranging from 8 H.P. to 60 H.P., single, double and triple-drum; all standard makes.

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#### Column Drifters and Tripods

- 4—Model 17 Denver rock drills.
- 3—Sullivan high-speed drills, Model FG-3.
- 5—Ingersoll Rand type X71 drifters.
- 4—Gardner Denver drills with drifter mountings.

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- 8—Jackhammers, consisting of Hardsoco, Worthington and Cleveland, 45 lb. and 85 lb. class.
- 4—Ingersoll Rand Model BCR-430 jackhammers, 47 1/2 lb.
- 1—No. 3 Hardsoco 50 lb.

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- 2—Gardner Denver derrick drills with Model 21 Gardner Denver drill; will drill 30 ft.
- 1—Ingersoll Rand drill, size D, with utility air hoist and Ingersoll Rand X71 drill.
- 1—Ingersoll Rand Model FM-2 drill, with Ingersoll Rand air hoist, size X71 drill, mounted on pneumatic tires; will handle 20 ft. steels.
- 2—Ingersoll Rand; Model FM-3, with air hoist and IX71 drill, mounted on 3 steel wheels; will handle 20 ft. steels.
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WE ALSO HAVE A LARGE STOCK OF DRILL STEEL WITH MISCELLANEOUS TIMKEN BITS.

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We have a large stock of centrifugal pumps, gas and elec. powered from 1 1/2" to 10". Also Dredging and vertical pumps.

- 36" x 24" Farrel Jaw Crusher, Type 12-B
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- 28" x 14" Climax Jaw Crusher, Ser. #1028
- 26" x 12" Champion Jaw Crusher, No. 6
- 58" x 36" Gruendler Single Roll Crusher
- 30" x 14" Allis-Chalmers Dbl. Roll Crusher
- 26" x 15" Farrel Double Roll Crusher
- No. 5 Allis-Chalmers Gyratory Crusher
- 10-ton Austin Western Road Roller
- 2-yard Manganese Shovel Bucket
- 1 1/2-yard Blaw-Knox Material Handling Bucket
- 9 1/2-yard Sauerman Dragline Hoist
- 1—5-ton Ingersoll-Rand Little David Air Hoist
- 6—6-ton Gearless Chain Hoist
- 1—5-ton Triplex Yale & Towne Chain Hoist
- 1—4-ton Cyclone Chain Hoist
- 1—3-ton Triplex Yale & Towne Chain Hoist
- 1—2-ton Triplex Yale & Towne Chain Hoist
- 4' x 8' Double Deck Summit Vibrator Screen
- 2' x 8' Triple Deck Tyler Niagara Vibrator Screen
- 3' x 6' Double Deck Stephens-Adamson Vibrator Screen
- 150' Heavy-duty Manganese Chain, 6" pitch, with K-2 attachments every third link
- 175' #131 Manganese Chain
- 150' #225 Chain with K-2 attachments
- 97—Manganese Type A Buckets 8 x 5 x 6
- 46—Manganese Type A Buckets 18 x 9 x 8
- 83—Manganese Type A Buckets 20 x 9 x 8
- About 1,000 Steel Buckets in the following sizes: 10", 12", 18", 24", and 26"
- 18" x 40' Portable Conveyor
- 30" x 197' Conveyor, with Frame, Belting and Speed Reducer
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- 24" x 65' Conveyor, with Frame, Belting and Speed Reducer
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- 18" x 49' Conveyor, with Frame, Belting and Speed Reducer
- 52 tons of brand new Government surplus blasting wire—550 reels—each reel containing 2 1/2 miles of wire—\$25 per reel

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- 1—Allis Chalmers No. 5 Superior McCully Crusher, 10" opening.
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- 1—Trommel Rotary Screen 4' dia. x 7'10" long, with drive and perforated screens 3/16", 5/8", 1", 1 1/4".
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- 2—Continuous Open Bucket Elevators, 25' centers with 6" x 10" buckets, and 35' centers with 7" x 11" buckets.
- 4—Chain Bucket Elevators, one 40' high with 5" x 8" buckets, three 21' high with 5" x 8" buckets, steel housings.
- 50' of 9" Screw Conveyor.

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Partial List Only—Send for Complete Listing

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Equipment Company  
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CARLYLE RUBBER PRODUCTS ARE  
NEW, GUARANTEED & LOW PRICED

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Width	Ply	Top-Bottom	Covers	Width	Ply	Top-Bottom	Covers
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42"	5	1/8"	1/16"	20"	4	1/8"	1/32"
36"	6	1/8"	1/16"	18"	4	1/8"	1/32"
30"	6	1/8"	1/16"	16"	4	1/8"	1/32"
30"	5	1/8"	1/16"	14"	4	1/16"	1/32"
24"	5	1/8"	1/32"	12"	4	1/16"	1/32"
24"	4	1/8"	1/32"				

Inquire For Prices - Mention Size and Lengths

## TRANSMISSION BELTING

### HEAVY-DUTY FRICTION SURFACE

Width	Ply	Width	Ply	Width	Ply
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16"	6	10"	5	5"	5
14"	6	8"	6	4"	5
12"	6	8"	5	4"	4
12"	5	6"	6	3"	4

Inquire For Prices - Mention Size and Lengths

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### APPROVED SPECIFICATION HOSE EACH LENGTH WITH COUPLINGS ATTACHED

Size	Length	Per Length
2 1/2"	50 feet	\$28.00
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2"	50 "	23.00
	25 "	13.00
1 1/2"	50 "	20.00
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Specify Thread On Couplings

## SPECIAL OFFER... HEAVY DUTY RUBBER HOSE

### WATER HOSE Each Length with Couplings Attached

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3/4"	25 feet	\$4.25
1"	50 "	8.00
	25 "	6.25
1 1/4"	50 "	12.00
	25 "	7.50
	35 "	10.50
	40 "	12.00
1 1/2"	50 "	15.00
	25 "	10.00
	35 "	14.00
	50 "	20.00

### AIR HOSE I.D. Size Length per Length Couplings

1/2"	25 feet	\$5.00	\$1.50 Pair
	50 "	10.00	1.50 "
3/4"	25 "	6.25	2.50 "
	50 "	12.50	2.50 "
1"	25 "	10.00	3.50 "
	50 "	20.00	3.50 "

LARGER SIZES ALSO AVAILABLE  
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81 1/2" x 18" x 1 5/8"

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- 1—Kochring "303" 3/4 yd. Shovel-Drillline for sale as a unit only—August 15 delivery

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Symmons 4' Standard Machine, in tip top shape, ready for work, complete with motor and drive.

P. O. BOX 538

Orange, N. J.



## FOR SALE

Complete Good Roads portable Crushing Plant 10' x 40' capacity 20 tons per hour.  
 3-34 x 36" Blake type Jaw Crushers, mang. fitted.  
 10 x 40" Good Roads roller bearing Jaw Crusher.  
 2-222 Allis-Chalmers type B Gyratory Crushers.  
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 Allis-Chalmers Superior 34 x 24" dbl. roll Crusher.  
 Barber-Greene Bucket Loaders 42 and 42B.  
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 3-yd. P & H 206 combination Machine.  
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 1-yd. Bucyrus-Erie Shovel, 150 HP Cummins Diesel Engine.  
 1 1/2-yd. Koehring 601 gas & 2-yd. 801 Diesel Shovels.  
 30' x 60' Link-Belt Apron Feeder.  
 36-2-ton Mine Cars 30" ga. and two 5-ton Westinghouse gas Locomotives 30" ga.  
 24' x 65' Jeffrey chain Bucket Elevator, buckets 24 x 14 x 17".  
 250 HP GE Slip Ring 440V Motor 585 RPM.  
 75 to 300 HP Fairbanks-Morse Diesel Engines.  
 30-ton Elec. Battery Locomotive, std. ga.

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One Traylor Heavy Duty Double Roll Crusher, 18" face, 42" diameter rolls. Roll frame and springs perfect; new babbit bearings; new cheek plates; roll shells worn. Also  
 Two 30 h.p. slip ring motors with grids and controls.

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- 1-Page "RC" 3/4 yd. New Drag Bucket
- 1-Daniels-Murtaugh "HS" 1 1/4 yd. New Drag Bucket
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all sizes

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### ROTARY SCREEN

Telesmith rotary screen, 5 sections, 5' dia. 25 feet long. Complete with motor, switches, 2 extra pinion drive gears, 25 extra pieces of screen.

For complete information and location write to

**JESSE S. MORIE & SON**

Mauricetown, N. J.

### FOR SALE

- 1-No. 7 Wonder mixer on rubber tired truck, gas powered with skip and water tank.
  - 1-2-inch Homelite pump.
  - 50-Steel forms for making the staple concrete post.
  - 10-Chase block cars.
  - 450 ft. 24" gauge track for block cars.
  - 1-Transfer car.
  - 400-2-hole 8" x 16" cast block pallets.
  - 5-Tripie seal vault forms, make 5 sizes.
- THE GALLEN CONCRETE TILE CO.**  
 Galien, Michigan

### FOR SALE

HOIST, 80 HP Lambert Electric, 44" dia. x 44" drum.  
 DRILL, D73 Gardner-Denver Dry Drifting with column.  
 SCREEN, Niagara Junior #1, vibrating, 18" x 72".  
 HYDRATOR, Clyde 10', #3.  
 TANK, 8' dia. x 30".  
 HOIST, B-2 Lo-Hed Electric, 440/3/60.  
 G. & W. H. CORSON, INC.  
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One 3 cu. yd. Jaeger Transit Mixer—Conventional type, mounted on heavy duty GMC Truck with Brown Lite Transmission—1000 x 20 tires—Both units in excellent condition and now working.

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A 12 foot marble rubbing bed.  
 Price, \$400.00 F.O.B. car.

**DELANO GRANITE WORKS**  
 DELANO, MINNESOTA

### FOR SALE

Belt Conveyors, 50 to 60 feet long.  
 Two cement bags cleaners.  
 Approx. 75 block racks on rails, ball bearing wheels. Rail Transfer.  
 Approximately 75 small racks, capacity 30 block per rack.  
 One No. 3424 Dixie Premier Jr. Non-Clog Hammermill-Hammer crusher.  
**CONCRETE & CINDER BLOCKS PRODUCTS CO.**  
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 Phone, Genesee 2121

# FREE SERVICE for BUYERS

Here is the quick way to get information and prices on machinery and equipment. Just check the item (or items) listed below about which you desire information. Then send this page to us, and we will take care of the rest.

TEAR OFF HERE

....Admixtures, Aggregate  
 ....Aftercoolers, Air  
 ....Aggregates (special)  
 ....Air Compressors  
 ....Air Separators  
 ....Asphalt Mixing Plants  
 ....Bagging Machines  
 ....Bags  
 ....Batchers  
 ....Belting, Conveyor, Elevator, Power Transmission  
 ....Belting, V-Type  
 ....Belt Repair Equipment  
 ....Bin Level Indicators  
 ....Bins and Batching Equipment  
 ....Blasting Supplies  
 ....Block Machines, Concrete Building  
 ....Bodies, Trailer  
 ....Brick Machines and Molds  
 ....Buckets  
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....Classifiers  
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 ....Coal Pulverizing Equipment  
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 ....Concrete Mixers  
 ....Concrete Mixing Plants  
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 ....Fans and Blowers  
 ....Flotation Equipment  
 ....Gasoline Engines  
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 ....Generator Sets  
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 ....Gypsum Plant Machinery  
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 ....Hoists  
 ....Hoppers  
 ....Kilns; Rotary, Shaft, Vertical

....Locomotives  
 ....Lubricants  
 ....Mills  
 ....Pulverizers  
 ....Pumps  
 ....Scales  
 ....Screen Cloth  
 ....Screens  
 ....Scrubbers; Crushed Stone, Gravel  
 ....Shovels, Power

....Speed Reducers  
 ....Tanks, Storage  
 ....Tractors  
 ....Trucks, Industrial  
 ....Trucks, Mixer Body  
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 ....Welding & Cutting Equipment  
 ....Winches  
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If equipment you are in market for is not listed above, write it in the space below.

Send to:

**Research Service Department  
ROCK PRODUCTS**

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Your Name..... Title.....

Firm Name.....

Street .....

City..... State.....

## FOR SALE

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at FALLING SPRING, VA.  
(located near Covington, Va.)

- 1—8 ton PLYMOUTH LOCOMOTIVE, Model D.L.L. with Climax Gasoline Motor, 42" Gauge.
- 14—EASTON & ATLAS ROCKER DUMP CARS, 78 Cubic Feet Capacity, 42" Gauge.
- 2—KOPPEL DUMP CARS, 4 yd. Capacity with Brakes, 42" Gauge.
- 1—OSGOOD STEAM SHOVEL, 1 yd. Bucket, Model 29.
- 1—BONNOT HAMMERMILL, 30" x 36" Serial No. 40, Belt Driven.
- 1—JEFFREY PULVERIZER, 36" x 24", Type 3, Serial 1899, Belt Driven.
- 1—GYRATORY CRUSHER, AUSTIN MFG. CO., No. 7½, Shop No. 3093.
- 1—ROTARY KILN, 8' x 75'.
- 1—LINK BELT Continuous Single Strand Bucket Elevator, No. 730 Chain, Buckets 12" x 10", Steel support 55' between centers.
- 1—LINK BELT Continuous Single Strand Bucket Elevator, Buckets 12" x 10", about 75' between centers.
- 1—18" BELT CONVEYOR, about 100' between centers.
- 1—WESTINGHOUSE A.C. GENERATOR, 500 K.V.A., 2400 V, 120, 5 Amps per terminal, 3 ph 60 cycle 600 R.P.M. Serial No. 1231045. Driven by a Pelton Waterwheel with Type P governor connected to Westinghouse D.C. Generator (Exciter) No. 80-L Type S.K. 13.5 KW, 135 V 100 Amps 1050 R.P.M.
- 1—WESTINGHOUSE D.C. Generator (Converter), N-750, Type S.K. 60 KW 550 V 91 Amps 1140 R.P.M. Serial No. 1321161. Driven by Westinghouse Induction Motor, 75 H.P. 2200 V 19.08 Amps 3 ph 60 cycle 1140 R.P.M. Serial No. 1321045.

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### NEW TUBE MILLS

*Ready for Immediate Shipment*

- 2—7' x 24' Allis Chalmers Tube Mills, Compeb design.

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- 1—6' x 22' Allis Chalmers #12 Tube Mill, with Link Belt Silent Chain Drive, completely reconditioned.

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- 2—8'6" x 7'6" x 125' long Vulcan Kilns
- 1—7'6" x 7' x 125' long Vulcan Kiln
- 2—5'6" x 5' x 60' Mosser Kilns
- 1—5' x 30' Ruggles-Coles A-8 Double Shell Rotary Dryer

### HOISTS

- 1, 3, 1, 1½ and 2 ton Chain Hoists, standard lift
- 1, 1, 1½ and 2 ton Electric Hoists, 3 ph, 60 cye. 220/440 V.

**Heat and Power**  
Company  
70 Pine Street, Whitehall 3-2172, New York, N. Y.

## SPECIAL!

### GASOLINE DRIVEN ARC WELDERS

300 ampere

Hobart, Duarc, P & H,  
Star

Driven by 6 cyl. engine  
*Write or wire at once for price  
—offered subject to prior sale.*

### MISCELLANEOUS

- 300 and 400 ampere Motor Driven Welders — General Electric, Hobart, Lincoln
- 5—Dings, Magnetic Separators IR 14, 110 V, 86 RPM with MG set
- 70 tons—¾" to 1½" chilled iron grinding balls

### PULVERIZERS

- 4—Raymond, 5-0, 4-0, 3-0
- 2—Schutz-O'Neill 20" and 18"
- 1—Kent 26" Pulverizer
- 1—35 KVA Gasoline Driven Power Plant, 3 ph., 60 cye., 220 volts
- 2—Schramm Compressors

### FOR SALE 24" GAUGE RAILROAD EQUIPMENT

- 2000—Track Feet 25-30 lb. Rail Complete with Steel Ties, Splice Bars and 4 Turnouts.
- 14—1½ Yd. All Steel Koppel and Easton Side Discharge Dump Cars, Roller Bearing Trucks.
- 2—8 Ft. Steel Frame Flat Cars, Roller Bearing Trucks.
- 2—H-7 Milwaukee Gasoline Locomotives.

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IRON & STEEL PRODUCTS, INC.**

41 Years' Experience  
13492 S. Brainerd Ave., Chicago 33, Illinois  
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- 1—80-ton Baldwin 0-6-0 separate tender switcher, built 1925. A.S.M.E. boiler, piston valves, Walschaerts valve gear, overhauled and up to date on all I.C.C. requirements.

- 1—30 ton Whitcomb Diesel-Mechanical 36" gauge locomotive, four wheel type.

- 2—20 ton gasoline locomotives, 4 wheel type, built 1941 and 1942, overhauled, standard gauge.

- 1—American "Gopher" Crawler crane, gasoline, ½ yd. completely rebuilt.

- 1—Williams Clamshell digging bucket, 1 yd. capacity, heavy duty type with teeth, practically new condition.

**Birmingham Rail & Locomotive Co.**  
BIRMINGHAM 1, ALABAMA

For Sale—

### SHASTA DAM SAND AND GRAVEL PLANT AND 10-MILE CONVEYOR EQUIPMENT

Including:

- 6000—36" AND 42" IDLERS.
- Pulleys and Drives.
- LATE MODEL 200 HP., 1800 R.P.M. GE MOTORS, complete with Starting Equipment.
- Western Gear Reducers, 200 HP., 40 to 1 Ratio.
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- Dorr Hydroseparator.
- 30" Tripper and Trestle.
- Merrick Weightometer.
- All Types of Pumps, complete with Drives.
- 42" Pendulum Boom Conveyors, 100' and 200'.
- Electric Line Equipment, Transformers, Motors and Supplies.
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- Subject to Prior Sale
- Write, Wire or Telephone Redding 1440
- COLUMBIA CONSTRUCTION CO., INC.**
- Box 579 Redding, California

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Dixie No. 2424 Premier Jr. Hammermill Crusher with 40 H.P. Motor 440-60-3. Overhauled in our plant \$2000.00 f.o.b. Our Plant.

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1—4' x 10" Type 38-V-16 Single Surface Hammer Vibrating Screen Complete, new, never used. Bargain.

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#### GYRATORY CRUSHER

No. 7½ Type K Allis-Chalmers with extra set of upper and lower concaves. Change in process makes this excellent crusher available.

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Plymouth Meeting, Pa.

**Move Your Idle Equipment with R. P. Classified**

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MACKS — WHITES

Heavy Duty Tandem — Axle 6x4 and 6x6 — Diesel and Gas — Duplex Transmissions — 100 x 24 Tires — 202 inch Wheelbase — Air Brakes — Suitable for Crane Mounting, Mixer Mounting or Heavy Duty Tractors. Can furnish and install any type of dump bodies. Immediate Delivery.

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1800' 18" 5-ply Quaker  
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All the above belting has 1/2 top and 1/32 bottom cover

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#### FOR RENT OR SALE

20 and 30 yd. air operated side dump cars — drop door and lift door types.

17 1/2 ton and 30 ton rebuilt steam locomotive cranes.

1 25-ton Davenport steam saddle tank locomotive.

1 Jorden spreader.

*The Latest in Concrete Block Plant Equipment*

**CLAPP RILEY & HALL COMPANY**

14 N. Clinton St. Chicago 6, Ill.

- 1—420 cu. ft. Schramm Diesel Air Compressor
- 2—20 ton Plymouth Std. Ga. Gas. Locomotives
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- 1—45 ton Plymouth Std. Ga. D. E. Locomotive
- 1—78 ton Baldwin type 0-6-0 side tank Locomotive
- 1—20 yard Western air-operated Dump Car
- 5—1855, 2568 and 3092 cu. ft. stationary Air Compressors, all direct connected to synchronous motors—new 1942 and 1943

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LANSDOWNE  
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Plant—2nd Street and Penna. R. R.,  
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SAND, GRAVEL AND CRUSHING PLANTS DESIGNED AND EQUIPPED. NEW AND USED CONTRACTORS EQUIPMENT FOR SALE AND RENT

- 1—25 ton Brownhoist Steam Loc. Crane
- 60 ft. Boom Dbl. Drum Std. Ga.
- CS Side Frames; New Code Boiler '44

Price .....\$4,850

1—3/4 yd. Orange Peel Grapple

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#### EXCELLENT VALUES

- 25 ton Orton Locomotive Cranes, new 1942, oil fired, 65' boom.
- 25 ton Ohio Locomotive Crane, gasoline powered, 55' boom, overhauled.
- 45 ton Davenport Diesel Elec. Locomotive, new 1942.
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- 20 ton Insley Steel Guy Derrick and Hoist.
- 25 ton Wiley Steel Stiffleg Derrick, new.
- 475 HP Fairbanks Morse 8 cyl. Diesel Engine.
- 120 HP Atlas 6 cyl. Diesel Generator Set.
- 24" x 36" Trailer Jaw Crusher.

**Mississippi Valley Equipment Co.**

515 Locust St. St. Louis 1, Mo.



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**BELT BUCKET ELEVATOR**, 60 ft. centers, buckets 22" wide x 11 1/2" x 10" projection, complete with wood frame.

**CLASSIFIERS**, Dorr, one 3' x 15' and one 2' x 15'.

**GYRATORY CRUSHERS**: All sizes and types.

**JAW CRUSHERS**: All sizes and makes, 10 x 20 to 48 x 60.

**REDUCTION CRUSHER**: Traylor 4 ft., type TV, with motor, V-belt drive, etc., complete.

**ROLL CRUSHERS**: Double Roll, Allis Chalmers 24 x 54" dia.; 18 x 42" dia.

**DRAG SCRAPER**: Sauerman 1 yd. capacity with Crescent drag scraper bucket, 60 H.P. gasoline powered, 2 speed, hoist, all cables, blocks, etc.

**VIBRATOR FEEDERS**: Jeffrey Traylor 6' x 6', open pan deck, powered by four No. 5 heavy M-4 motors, including motor generator equipment for 440 volt, 3 phase, 60 cycle, operation; capacity 1500 tons of earth and stone per hour, maximum size stone 8' cubes, 1-48" x 10' with two 58M, 4 power units.

**ELECTRIC MINE HOISTS**: 1—Single drum 10' dia., 7' face, 450 H.P. 1—10' dia., 10' face, 450 H.P. Each complete with all auxiliary equipment.

**ELECTRIC WINCH HOISTS**: suitable for car spotting; 2—Single drum 12 1/2" dia., 16" face, with winch.

**KILNS, COOLERS, DRYERS**: 1—7' 6" x 100' and 1—6' 6" x 120', with or without all necessary auxiliary equipment. 1—10' x 90' cooler or dryer. Also, several other sizes.

**LOCOMOTIVE—GAS**: 25 ton, standard gauge, air brakes, etc.

**LOCOMOTIVE—STEAM**: 1—Lima 80 ton, 6 wheel, Switcher with tender, thoroughly modern, excellent condition. Sale or rent.

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**NEW CONVEYOR BELT**: Large quantity 42" and 60" Conveyor Belt, 6 and 7 ply, 7/16" top cover, 1/16" bottom cover, 42 oz. duck, all New, Pure rubber.

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Lansdowne Theatre Bldg.  
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Sauerman Slackline Cableway: 1 1/2 cu. yd. unit, complete with 90 foot mast and all necessary cables; also includes a Thomas Two Speed Hoist, Sheaves, cable hoist. All this equipment is in excellent condition. Price \$5,000.00 net.

Write or wire  
**Waverly Gravel & Tile Company, Inc.**  
Waverly, Iowa

### FOR SALE

1—Nordberg two drum hoist, two speeds, with International 100 H.P. diesel engine.  
Price \$3000.00

**DENNIS MATERIALS COMPANY**  
Yarnell Road Rural Route 12  
Kirkwood, Mo.

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Bucyrus-Erie 48B Diesel shovel-crane 2 yds.  
Koehring Model 601 shovel-crane 1 1/2 yds.  
Koehring Model 601 Diesel shovel, 3 yards.  
Lorain 75B 1 1/2 yd. shovel and crane.  
Link-Belt Diesel crane 1 1/2 yd. with 60' boom.  
Lima 1 1/2 yd. gas shovel.  
Marion 37 shovel, steam, 1 1/2 yds.  
Marion Model 450 steam shovel, 1 1/2 yds.  
Marion Model 450 gas-elec. shovel, 1 1/2 yds.  
Marion Model 331 gas shovel.  
Northwest Model 104, 1 1/2 yd. crane, boom 70'.  
P & H 400 shovel-crane 1/2 yds. capacity.  
Universal 35, shovel-crane-backhoe, 1/2 yd.  
Lorain 40 truck crane, 8 tons capacity.  
Speeder shovel-crane, 1/2 yd. capacity.  
Northwest 105 shovel-crane-backhoe, 1 yd. cap.  
Bucyrus-Erie 50B steam shovel, 2 yds.  
Monaghan 3 1/2 W. Diesel dragline, 92 ft. boom.  
Osgood 1 yd. shovel-crane.  
Bucyrus-Erie elec. tunnel shovel, 1 yd.  
Osgood 1 1/2 yd. shovel.  
Osgood shovel, 1 1/2 yds. gas.  
Lorain model 75B shovel-crane 1 1/2 yds.  
Byers Bear Cat 1/2 yd. crane.  
Byers Bear Cat 3/4 yd. backhoe and crane.  
Gantry crane, 5 ton, 46 ft. span, 15 ft. overhang.

### TRACTORS AND MISCELLANEOUS

International TD14 tractor with bulldozer.  
International TD35 tractor with bulldozer.  
Caterpillar D6 tractor with 6 yard scraper.  
D2 tractor.  
Allis-Chalmers HD-10 tractor and angledozer.  
Allis-Chalmers HD-7 tractor with Trailblazer.  
Allis-Chalmers WS tractor with bulldozer.  
Cietrac 40D tractor with angledozer.  
Allis-Chalmers K tractor with bulldozer.  
Allis-Chalmers Model L tractor with 8 yd. scraper.  
Cat. D7 tractor with double drum control; G6 scraper.  
Cat. D50 tractor with 6 yd. scraper.  
International TD 13 tractor with bulldozer.  
International TD 40 tractor with bulldozer.  
Buffalo-Springfield 10 ton 3 wheel road roller new 1941.  
2 Dempster Dumpsters with 20 buckets.  
Bucket elevator, vertical, 35' 22" buckets.  
Galion 10-ton, 3 wheel roller.  
Drill steel, 1 1/2", bitting and shanked.  
500 drill bits, 1-H and Timken. Various sizes.  
Several dredge pumps available from 6" up.  
3 Euclid Model 1-2WV dump trucks.

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Smith 1 1/2 yd. tilting mixer 30 hp. electric drive.  
3 B-K 5 yd. transit mixers on Mack truck.  
Jaeger, 4 yd. truck mixer on Mack truck.  
2 Jaeger 3-yd. truck mixers, unmounted.  
2 Jaeger 5 yd. truck mixers, unmounted.  
2 Jaeger 7 yd. truck mixers, unmounted.  
3 Rex 5 yd. truck mixers, unmounted.  
Rex, 4 yd. truck mixer on Autocar.  
Mixer 288, Smith electric stationary.  
Mixer, 568, Smith tilting skid mounted.  
Mixers, two Bamsco 425, elec. Right and left.  
Mixer, Koehring 288, gas, skid mounted.  
Mixer, Jaeger 148, on pneumatic tires.  
Fuller Kinyon bulks cement unloader portable.  
Koehring 34E dual drum paver.

### ASPHALT PLANTS

Standard Plant 3000 lb. cap. Complete, self-contained, including Diesel generating set.  
Cedar Rapids Portable 60-80 tons per hour cap.

### CRUSHERS—CRUSHER PLANTS

Roll, 54x24, 54x36, 48x36, 30x24.  
Allis-Chalmers 42" gyratory.  
Gyratory crusher: K.V.S. 30, 37-S, 40; 32, 8A, 8B; Traylor 8"; McCully, 13", 8", 6".  
Allis-Chalmers 6" fine reduction crusher.  
Jaw: 6x12, 6x18, 10x20, 14x24, 12x20, 13x30, 16x32, 24x50.  
Complete Rock Crushing, Sand and Gravel Plants.

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Blaw-Knox 1/2 yd. clam, digging.  
Hayward 1/2 yd. clam, digging.  
1/2 yd. Halse Clamshell, rehandling.  
10 Battleship 3-3 yd. steel stone skips.  
Hayward 1/2 yd. Standard Orange Peel.

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Mack 60 ton std. ga. gas locomotive.  
Whitcomb 20 ton 36" ga. Diesel loco. Rebuilt.  
Baldwin-Westinghouse 25 ton elec. loco., std. ga.  
American 45-ton, steam, saddle tank.  
Vulcan 30-ton, steam, saddle tank.  
Vulcan 25-ton, steam, side saddle loco.  
Vulcan 8-ton, std. gauge, gas.  
Vulcan 8-ton, gas, 36" gauge.  
Porter 12-ton, saddle tank, steam, 36" gauge.  
3 Western Steel, 30 yd. air dump cars.

### RICHARD P. WALSH CO.

30 Church St. New York, N. Y.  
Telephone: Cortlandt 7-0723 Cable: RICHWALSH

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40 Ton Butler Steel Bin No. 1 condition. Two 5' x 24" revolving stone screens 90% new.

**McARTNEY MACHINERY CO.**  
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**AIR COMPRESSORS**  
BELTED: 355, 528, 676, 1000, 1200 & 1570 Ft. ELECTRIC: 478, 676, 807, 1324, 1723 & 2200 Ft. DIESEL: 503, 807 & 1000 Ft.  
**PORTABLE GAS**: 110, 160, 230, 310, 540 & 1300 Ft. STEAM: 40, 310, 528, 1300, 2310 & 3600 Ft.

**CLAMHELL BUCKETS, SKIPS & GRAPPLES**  
Owen B & H Stone Grapples.  
2 Yd. OWEN Type 8 Material Handling.  
1 1/2 Yd., 1 Yd., & 1/2 Yd. HAYWARD Class E.  
18 Steel Skips 6 1/2 x 6 x 2 1/2.  
5 Ton Bucyrus Rock Grabs.

### CRANES AND DRAGLINES

1-16 Yd. 160' Boom Electric Caterpillar Drag-line.  
1/2 Yd. 5 Ton O & S 30 Ft. Boom.  
12 Ton NORTHWEST 50 Ft. Boom Gas.  
20 Ton LIMA, 750 Diesel, 65 Ft. Boom.  
25 Ton BROWNING & 30 Ton AMERICAN Loco.  
25 Ton LINK BELT K-48 Electric, 70 Ft. Boom.

### CATERPILLAR SHOVELS

2 Yd. Marion Steam Shovel.  
1/2 Yd. 1 1/2 Yd., 2 Yd., & 4 Yd. MARION Electric 1 Yd. NORTHWEST Gas.  
1 1/2 Yd. LIMA Diesel.  
1 1/2 Yd. BUCYRUS 41B Steamer.  
4 Yd. Bucyrus 120B Electric. Also 3 yd. Erie Elec.

### DUMP CARS

46-KOPPEL 1 1/2 Yd 24 & 30 In. Ga., V Shaped.  
15-2 Yd., 3 Yd., 4 Yd., 6 Yd., 12 Yd., 36 In. Ga.  
20-Std. Ga. 12 Yd., 16 Yd., 20 Yd. & 30 Yd. Cap.  
15-Std. Ga. 50 Ton Battleship Gondolas

### BOX, FLAT & TANK CARS

9-50 ton std. ga. heavy duty flat cars.  
30-8000 gal. cap. tank cars.  
30-40 ton std. ga. box cars.

### HOISTING ENGINES

Gas: 15, 20, 60, 100 & 120 HP.  
Electric: 30, 52, 80, 100 & 150 HP.  
Steam: 6 1/2 x 8, 7 x 10, 8 1/2 x 10, 10 x 12, 12 x 24.

### DIESEL UNITS

75, 90, 120, 200 HP. F. M. Engines.  
175 KVA Worthington 3/60/2300.  
275 KVA Fairbanks 3/60/2300.  
343 KW. Fairbanks-Morse 3/60/450 V.  
4-500 KW Baldwin 3/60/440 V.

### BALL, ROD AND TUBE MILLS

5'x22" HARDINGE CON. Dry Ball Mill.  
6'x22" HARDINGE CONICAL Pebble Mill.  
8'x22" HARDINGE CONICAL Ball or Pebble Mill.  
4x8, 8x8 & 10x8 Straight Ball Mills.  
4x16, 5x18 & 5x22 Tube Mills 6'x22".  
3 1/2 x 8 & 5x7 Air Sweep Tube Mills.  
2x4 1/2, 6x12 & 5x12 ROD MILLS.

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JEFFREY 24x20 & No. 1 Sturtevant Ring Roll.  
RAYMOND Auto Pulverizer No. 0000, 0 & 3.

### STEEL STORAGE TANKS

10,000 Gal., 15,000 Gal. & 20,000 Gal. Cap.

### SEPARATORS AND COLLECTORS

8, 10 and 14 ft. Separators, Gavco & Bradley.

### ROLL CRUSHERS

36x60 Fairmount & 36x20 Diamond.

### JAW CRUSHERS

10x8, 13x7 1/2, 14x7, 15x9, 15x10, 16x9, 16x12, 16x10, 18x11, 20x8, 20x6, 20x10, 20x12, 26x12, 30x15, 30x13, 30x15, 36x30, 36x18, 36x14, 36x9, 36x6, 36x10, 36x24, 42x9, 48x24, 48x36, 60x45, 60x36, 36x16, 9x36.

### CONE & GYRATORY CRUSHERS

5 No. 19, 25, 37 & 40 Kennedy.  
18 in., 24 in., 30 in., 36 in. & 48 in. Symons Disc.  
4-10 T2 Traylor 4 ft. Gyratory.  
4-No. 5, 3 & 6 Austin Gyratory.  
2-Traylor T-12 Bulldog Gyratory, also 16 inch 8 in. Traylor T. Gyratory.  
17 Gates K-Nos. 3, 4, 5, 6, 7 1/2, 8, 9 1/2 & 21.  
7-Symons Cone, 2, 3, 5 1/2, and 7 ft.  
6, 10 & 13 inch Superior McCullys.

### CONVEYOR PARTS

BELT: 1000 Ft. 60 in., 700 Ft. 48 in., 600 Ft. 36 in., 800 Ft. 30 in., 1642 Ft. 24 in., 517 Ft. 20 in., 297 Ft. 18 in., 500 Ft. 16 in., 300 Ft. 14 in.  
IDLERS: 54 in., 42 in., 36 in., 30 in., 24 in., 20 in., 18 in., 16 in., 14 in., 12 in.  
Head & Tail-Pollers-Takeup for all sizes.  
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36 In.x30 Ft. 3 Ft.x30 Ft. 4 Ft.x30 Ft. 54 In. x30 Ft. 42 In.x24 Ft. 5 Ft.x30 Ft. 5 Ft.x16 Ft. 5 Ft.x16 Ft. 6 Ft.x16 Ft. 6 Ft.x20 Ft., 6 Ft.x20 Ft., 10x20, 7 1/2x10 & 8x10 Ft. Kilns.

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GUY: 8 Ton 85 Ft. Boom, 15 Ton 100 Ft. Boom, 20 Ton 115 Ft. Boom, 50 Ton 100 Ft. Boom.  
STIFF LEG: 5 Ton 70 Ft. Boom, 15 Ton 100 Ft. Boom, 25 Ton 100 Ft. Boom, 75 Ton 135 Ft. Boom.

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HUMMER ROTEX, NIAGARA & ROBINS.  
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2-No. 0 Sturtevant Rotary Fine Crushers  
No. 16-40 Gruendler Peerless Grinder  
2"x3" Denver 21 Laboratory Jaw Crusher  
2"x6" Sturtevant Roll Jaw Laboratory Crusher  
2"x6" Open Door Laboratory type Jaw Crusher  
4"x6" A-C Roll Jaw Laboratory Crusher  
A-C Gyratory 3-D Reduction Crusher, Short Head  
11" Traylor Bulldog Gyratory Crusher  
18"x22" D Acme Jaw Crusher  
9"x15" Champion Jaw Crusher  
24"x24" Single-Roll Crusher, with Knobs

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Revolving: 66"x10", 5"x18" and 30"x12"

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1/2 and 5 hp. Reeves Motor Drives  
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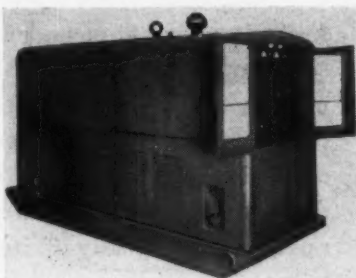
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PORTLAND CEMENT CLINKER—in bulk, in one lot, or monthly shipment.  
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ASPHALT ROLLERS—5 to 10 tons.

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Size 3 to 6 inches

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Ten 15-ton or eight 20-ton Euclid Diesel End Dump Trucks.

One thousand lineal feet of 54" Conveyor Belting with troughing carriers, idlers, pulleys, drives, speed reducers and electric motor. Also steel framing for above conveyor. All equipment to be in first class mechanical condition.

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One Stearns Clipper Stripper, Pallets, Molds, Lift Trucks, Metal Racks, Besser 30 Cu. Ft. Mixer & Skip Hoist. All Brand New. To Be Sold as Unit.

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### PRE-MIX CONCRETE PLANT

In fastest growing city in the west. Bulk Plant—Mixer Trucks—Gravel Trucks—Large Tract Gravel—Bunkers and Crushers. \$104,000 business January to June 30th this year. Liberal terms.

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### CIVIL ENGINEER

With contacts in cement works, coal mines, etc., wants to represent American equipment manufacturers.

Write GILLOT  
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YOUR ASSETS and CAPITAL STOCK are WORTH MORE NOW  
We are willing to

**PAY YOU  
CASH**

For Your

• INDUSTRIAL PLANTS  
• MFG. DIVISIONS or UNITS

We are principals acting in our own behalf. All transactions held in strictest confidence. Personnel retained wherever possible.

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### WANTED

Concrete Block Plants complete or will pay cash for good used concrete machinery and equipment.

### AARON MACHINERY CO., INC.

45 Crosby Street  
New York 12, N. Y.

## POSITIONS WANTED

### POSITION WANTED

American recently engaged in design and erection of South American plant is now available for position as Superintendent; many years and wide experience in cement manufacture—both processes. Write Box D-99, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

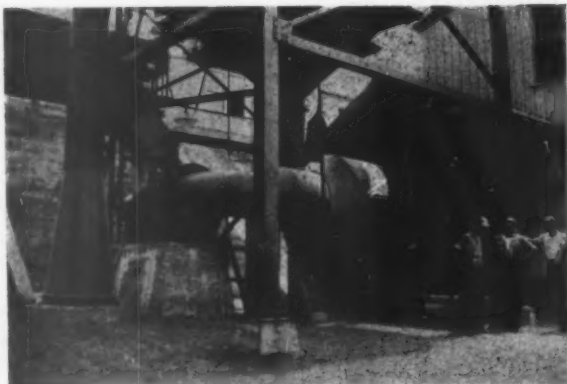
CONSTRUCTION ENGINEER and superintendent, with twenty years experience in highway, public works and building construction fields, is desirous of locating in southwest U. S. Also interested in connection in the manufacture and/or sales of ready-mixed concrete, building materials and building specialties. Recently separated from Army as Lt. Colonel. Married. Age 40. Write Box E-5, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

ENGINEER, graduate—desires position as plant superintendent or engineer. 15 years' experience in mining, quarrying, crushing, grinding and processing, and in plant design and construction. Reliable, responsible. Will build an effective organization. Write Box D-77, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

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FORMER ARMY MAJOR with twenty years' experience as chief chemist and assistant chief chemist in modern cement plant desires a position, preferably the west coast. Am willing to go to Mexico or South America, if inducement is satisfactory. Write Box C-95, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

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**MOST DIVERSIFIED**  
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*...in 9 Distinct Types*

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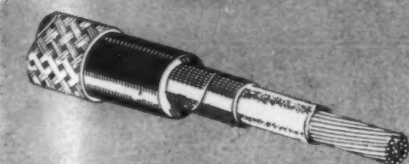
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## of U.S. SHIPBOARD CABLE

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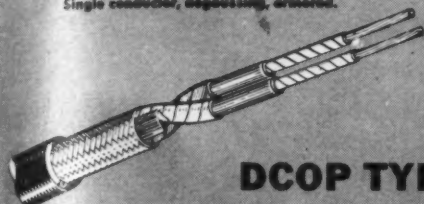
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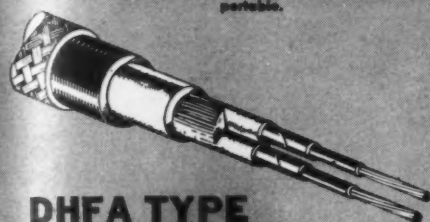
#### SDGA TYPE

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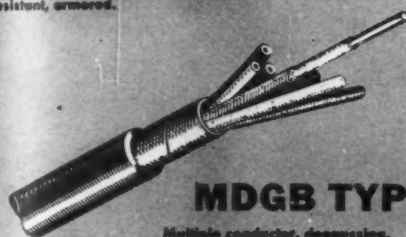
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#### MDGB TYPE

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**KOEHRING  
605**

## **SMOOTH SLOPING** *is easy*

● Much costly hand work can be eliminated because the Koehring 605, equipped with the new Koehring Power Clutch, makes smooth sloping easy for any operator.

Unlike a conventional booster clutch, the Koehring Power Clutch never "takes over". Although the operator in average operation never uses more than a 10# pull to set the big 37" main clutches of the 605, he still has full "feel" and perfect control of the bucket at all times. He slopes

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This new Koehring Power Clutch is only one of many improvements on the 605 . . . see your Koehring distributor to get the complete story.

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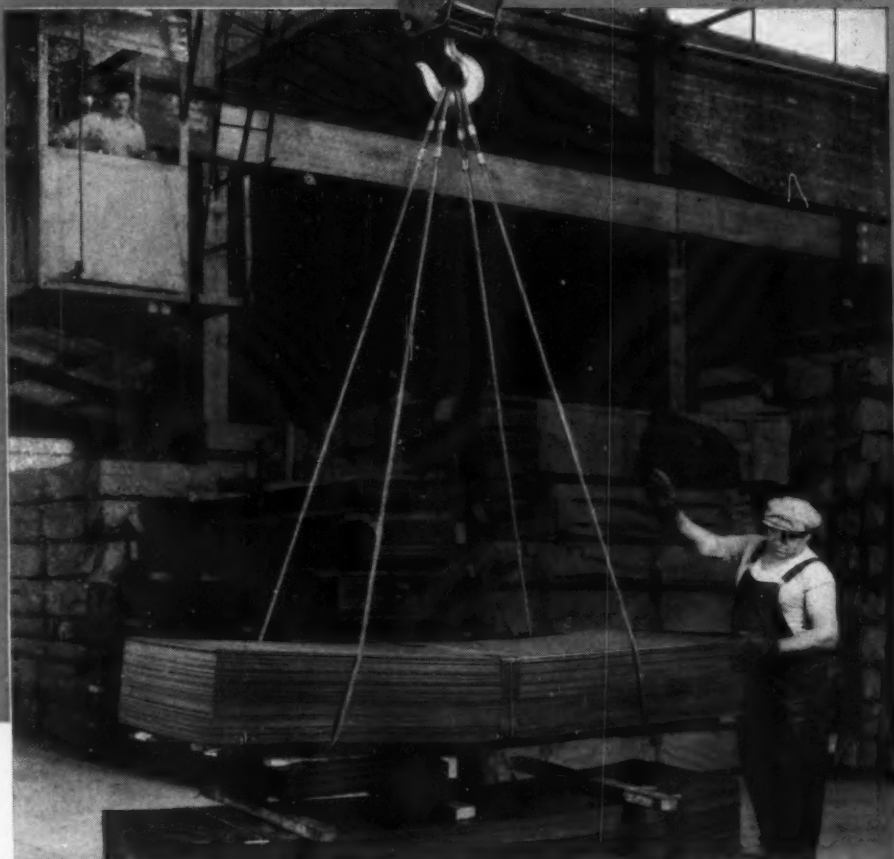
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**from OPEN STOCK**



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 AMERICAN CHAIN & CABLE**

*In Business for Your Safety*



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# AND that the OPERATOR Will Use!

"Sure . . . a blade angling and tilting feature can be a big help on plenty of jobs . . . but I'll be darned if I'll bother to angle or tilt if it takes a half hour to do it! I want to move dirt!" The Speaker? Almost any blade equipment operator. It's no problem to get your operators to use the effective angling and tilting features of Bucyrus-Erie Bullgraders, because they're both so easy to do — fast. Without tools, the operator angles the blade by pulling the landside pins, adjusting the blade to the correct angle, and replacing the pins. To tilt, he uses a landside pin

# TILTING



to hammer out the wedges that hold the blade in position, shifts the blade to the tilt he wants, hammers the wedges back in place. Neither angling nor tilting takes more than a couple of minutes!

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